

GUIDELINES FOR MEDICINES MANAGEMENT FOLLOWING BARIATRIC SURGERY

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

INTRODUCTION

This guideline covers medication issues in adult patients following bariatric surgery. Perioperative antibiotic prophylaxis is not included.

THIS GUIDELINE IS FOR USE BY THE FOLLOWING STAFF GROUPS :

All qualified healthcare professionals involved in prescribing, managing or administering medication to patients who have had bariatric surgery.

Lead Clinician(s)

| Chris Parry | Senior Surgical Pharmacist |
|---|---|
| Keith Hinton | Clinical Team Lead Pharmacist, Critical Care, Surgery and Theatres |
| Approved by Surgical Divisional Quality Governance on: | 30 th June 2021 |
| Ratified by Medicines Safety Committee on: | 14 th September 2022 |
| Review Date: This is the most current document and is to be used until a revised version is available | 14 th September 2025 |

| Guidelines for medicines management following bariatric surgery | | | |
|---|--------------|--|-----------|
| WAHT-PHA-019 | Page 1 of 26 | | Version 4 |

It is the responsibility of every individual to check that this is the latest version/copy of this document



Key amendments to this guideline

| Date | Amendment | By: |
|---------------|---|---------------|
| January 2018 | Inclusion of advice for the management of diabetes for | Keith Hinton |
| | Alternatives to Forceval included | |
| August 2018 | Relaxation of the necessity to use soluble/liquid | Keith Hinton |
| | Removal of ursodeoxycolic acid from the prescribing checklist | |
| October 2020 | Change ranitidine to PPI | Keith Hinton |
| | Supplemental dose of iron updated in line with BOMSS | |
| October 2021 | Document extended for 3 months whilst reviewed and approved | MSC |
| February 2021 | Document extended as per Trust agreement 11.02.2021 | |
| July 2021 | Document reviewed and approved | MSC |
| August 2022 | Change of Adcal D3 to Calci-D in line with formulary status Addition of references to support change | Harry Tillott |

| Guidelines for medicines management following bariatric surgery | | | |
|---|--------------|--|-----------|
| WAHT-PHA-019 | Page 2 of 26 | | Version 4 |



GUIDELINES FOR MEDICINES MANAGEMENT FOLLOWING BARIATRIC SURGERY

BACKGROUND

Within the context of an emerging obesity epidemic, healthcare professionals are increasingly encountering patients who have undergone bariatric surgery. This guideline explores some of the medicines management issues after bariatric surgery.

TYPES OF SURGERY

Bariatric surgery includes a range of different procedures, each with differing effects on drug therapy. This guideline focuses on the most commonly performed in Worcestershire:

Laparoscopic adjustable gastric banding (LAGB)



RESTRICTIVE + MALABSORPTIVE

Roux-en-Y gastric bypass (RYGB)



Laparopscopic sleeve gastrectomy (LSG)

RESTRICTIVE



| Guidelines for medici | ines management follow | wing bariatric surgery | |
|-----------------------|------------------------|------------------------|-----------|
| WAHT-PHA-019 | Page 3 of 26 | | Version 4 |

WAHT- PHA-019 It is the responsibility of every individual to check that this is the latest version/copy of this document



The potential effects and consequences that bariatric procedures may have on absorption and action of medications should be carefully considered before surgery. Bariatric surgery may introduce anatomical and physiological changes in the gastrointestinal tract which may affect drug pharmacokinetics. Absorption of drugs is predominantly affected, but tissue distribution, drug metabolism and elimination may also be affected.

Theoretical pharmacokinetic effects of bariatric surgery include:

- Reduced surface area for absorption
- Quicker transit through gastric pouch
- Raised pH (less acidic environment) due to reduced stomach acid production
- Reduced pre-systemic metabolism may increase bioavailability (attributed to one reported fatal case of enalapril toxicity following RYGB). Caution should be exercised when restarting medications postoperatively, particularly with compounds known to be metabolized by the P450 cytochrome system.
- Reduced enterohepatic cycling.
- Reduced mixing of stomach contents leading to reduced disintegration and dissolution.
- Reduced bioavailability of those drugs which rely on food for their absorption e.g. carbamazepine, lithium and spironolactone.
- Altered pharmacokinetics due to significant weight loss.

Medicines that require plasma level monitoring should be checked more frequently after surgery to assess the effect of these potential altered pharmacokinetics.

PRE-OPERATIVE MEDICATION

- Oestrogen therapy should be stopped at least one month pre-operatively to reduce the risk of post-operative thromboembolism.
- Candidates for bariatric surgery may take several medicines to treat or prevent co-morbidities. Following LAGB, LSG or RYGB, most patients find they can stop or reduce their dose of:
 - Antihypertensives
 - Lipid-lowering agents
 - Diuretics
 - o Analgesics
 - Insulin (for type 2 diabetes mellitus)
 - Oral hypoglycaemics. These may be discontinued postoperatively under the guidance of the diabetes team if there is clinical resolution of diabetes demonstrated by normalised blood glucose and HbA1c. See dedicated section below.
- If metformin is required to continue postoperatively consider using a reduced dose after RYGB due to the possible increased bioavailability.
- Patients must be closely monitored to titrate down doses or stop medication that is no longer required, thereby avoiding hypotensive or hypoglycaemic episodes.

These medicines may need to be restarted if weight is regained.

| Guidelines for medicines management following bariatric surgery | | | |
|---|--------------|---------|---|
| WAHT-PHA-019 | Page 4 of 26 | Version | 4 |



KEY PHARMACEUTICAL CONSIDERATIONS

There may be a problem swallowing certain tablets following surgery and each patient should have a medication review with their GP. Patients will be individually assessed as part of their pre-operative assessment with their medication and if appropriate some medications may need to be adjusted to aid swallowing after the surgical procedure.

If you require further advice in managing medication in a patient who has had bariatric surgery contact should be made with the ward pharmacist or Medicines Information (ext 30235). Outof-hours: for urgent enquiries contact the on-call pharmacist via switchboard

Checklist for medication review

- Up to 8 weeks after surgery: Oral medication may need to be in a liquid, crushed or chewable form - crushing tablets or opening capsules is not always appropriate and is usually off-label (out of licence).
- Liquid medicines: Stagger doses to prevent overloading the small gastric pouch.
- □ Consider **non-oral routes** where possible.
- Enteric-coated (gastro-resistant) or modified-release oral preparations should be switched to immediate-release preparations or alternative drugs where possible.
- Peak plasma concentrations may occur quicker without changing overall amount of drug absorbed. Anecdotally, more frequent, smaller doses (e.g. of opioids) may circumvent this problem. This caution extends to alcohol.
- □ Weight-based doses of medicines may require adjustment e.g. infliximab.

There is very little evidence for these effects in practice so this guideline cannot make specific recommendations on individual drugs.

The effect of bariatric surgery on pharmacokinetics of medicines is a complex mix of the issues above. Changes should not be made to drug therapy based on just one of these effects. Instead, all patients should have frequent monitoring to identify decreased efficacy or adverse effects, particularly for drugs of narrow therapeutic index.

| Guidelines for medicines management following bariatric surgery | | | |
|---|--------------|--|-----------|
| WAHT-PHA-019 | Page 5 of 26 | | Version 4 |

MANAGEMENT OF PATIENTS WITH DIABETES UNDERGOING BARIATRIC SURGERY

Establish and clearly document whether the patient has Type 1 or type 2 Diabetes

MANAGEMENT OF TYPE 2 DIABETES

PRE-OPERATIVE

Oral hypoglycaemic tablets

- Check HbA1c 1 2 months before surgery if above 70mmols liaise with the diabetes team.
- All patients with Type 2 diabetes should stop all oral hypoglycaemic agents except metformin when starting the preoperative diet unless otherwise advised by the diabetes team.
- Patients who have continued on oral hypoglycaemic tablets (except metformin) need regular blood glucose monitoring. This should include a daily pre-breakfast blood glucose test, twice weekly pre meal and before bed tests (4 point profile) when commencing the pre op diet.
- All oral hypoglycaemic agents should be stopped on the day of surgery.

Injectable therapies

Continue taking GLP-1 agonists while on the pre op diet but stop on the day of surgery. If experiencing hypoglycaemia (blood glucose below 4mmols) or tight glycaemic control (blood glucose 4-7mmols) stop GLP1 agonist.

Insulin treated type 2 diabetes.

- Refer to Diabetes Specialist team by Tier 3 dietitian when patient is ready to attend the presurgery groups.
- Confirm with the Diabetes team that the patient has definitely not got Type 1 Diabetes
- Increase blood glucose monitoring to 4 times daily (before meals and before bedtime).
- Reduce the usual insulin dose by 50% once commenced on the preoperative diet. The insulin dose subsequently may need to be adjusted or stopped during the pre op diet depending on blood glucose monitoring results.
- On day of surgery stop all insulin therapy unless otherwise stated by the Diabetes team but continue blood glucose monitoring 4 times daily.

| Guidelines for medicines management following bariatric surgery | | | |
|---|--------------|--|-----------|
| WAHT-PHA-019 | Page 6 of 26 | | Version 4 |

It is the responsibility of every individual to check that this is the latest version/copy of this document



MANAGEMENT OF TYPE 2 DIABETES

POST OPERATIVE.

Continue monitoring blood glucose 4 times daily before meals and before bedtime, stop if results are within normal range 4 – 7mmols.

If blood glucose consistently between 7 – 11mmols consider recommencing metformin as tolerated (restart at a reduced dose after RYGB due to possible increased bioavailability)

Check HbA1c 3 months post-surgery for patients:

- On insulin
- Remaining on multiple oral diabetes agents,
- On a GLP1 agonist
- Has had diabetes diagnosed for over 10 years duration
- blood glucose above 11mmols

| Guidelines for medicines management following bariatric surgery | | | |
|---|--------------|--|-----------|
| WAHT-PHA-019 | Page 7 of 26 | | Version 4 |



MANAGEMENT OF TYPE 1 DIABETES PRE-OPERATIVE

- All patients to be referred to the Diabetes Specialist Team by the Tier 3 dietitian.
- All patients must continue with insulin.
- If they are on basal insulin (Levemir, Lantus, Abasaglar, Tresiba, Toujeo) this will require a dose reduction of 20% when commencing the pre op diet. Titrate the dose according blood glucose levels.
- Quick acting insulin (Novorapid, Humalog, Apidra) will be required with meals but reduce by up to 50% when starting the pre op diet. Titrate the dose according blood glucose levels.
- Regular home blood glucose monitoring required (pre-meal and pre-bed) with access to ketone testing if blood glucose levels are elevated.

POST-OPERATIVE

- Continue basal insulin (reduce the dose by 20%) alongside CVRIII if indicated see Guideline WAHT-END-011
- Quick acting insulin (Novorapid, Humalog, Apidra) will be needed once tolerating carbohydrates above 20 grams per meal, as advised by the DSN

| Guidelines for medici | nes management follow | wing bariatric surgery | |
|-----------------------|-----------------------|------------------------|-----------|
| WAHT-PHA-019 | Page 8 of 26 | | Version 4 |



Impact of surgery on nutrition

All patients will have a comprehensive nutritional assessment prior to bariatric surgery. Any nutritional deficiencies identified pre-operatively will be corrected as clinically indicated. Nutritional deficiencies may also occur as a result of the surgery (see below)

| Surgical procedure | Impact on nutrition |
|----------------------|---|
| Gastric band | No impact on absorption. |
| | Over tight gastric bands can affect nutritional quality of diet due to |
| | poor tolerance of healthy foods, particularly those rich in protein and |
| | iron. |
| Sleeve gastrectomy | May be some impact on absorption including iron and vitamin B12 |
| Gastric bypass | Impacts on absorption of iron, vitamin B12, calcium and vitamin D |
| | Long limb bypasses may affect absorption of protein, fat, vitamin A |
| | and trace elements |
| Duodenal switch (DS) | Malabsorptive procedure with significant risk of nutrient deficiencies. |

| Guidelines for medici | ines management follow | wing bariatric surgery | |
|-----------------------|------------------------|------------------------|-----------|
| WAHT-PHA-019 | Page 9 of 26 | | Version 4 |

POST-OPERATIVE COMPLICATIONS

Thromboembolism – If VTE risk outweighs bleed risk, offer mechanical thromboprophylaxis and/or enoxaparin until mobility no longer significantly reduced (usually a minimum of 14 days after bariatric surgery but may be extended to 28 days on clinician advice) – dosing as follows (UKCPA 2010):

| Weight | 50-100kg | 100-150kg | >150kg |
|----------------------------|------------------------------|-----------|----------|
| Enoxaparin dose | 40mg od | 40mg bd* | 60mg bd* |
| *unlicensed doses recommen | ded by UK Medicines Informat | ion | |

Post-operative nausea and vomiting – can be caused by analgesics, eating too much, eating too quickly or not chewing sufficiently. Due to the risks posed by vomiting to the post-operative gut, prophylactic antiemetics should be prescribed. A combination of two antiemetics working by different mechanisms may be needed. Severe vomiting may warrant electrolyte and/or vitamin supplementation.

Gout – high protein diets and weight loss can precipitate gout.

- In patients with a history of gout, consider prophylactic allopurinol. Initiate several weeks before surgery and continue until no longer clinically appropriate.
- In an acute attack, consider colchicine before NSAIDs.

Gallstones – rapid weight loss can precipitate gallstones. Ursodeoxycholic acid may be considered for treatment and prophylaxis

Ulceration and reflux – prescribe lansoprazole orodispersible 30mg daily and continue for 3 months post-op. In the case of ongoing reflux, consider continuation of lansoprazole beyond 3 months (Malone 2005).

| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|--|-----------|
| WAHT-PHA-019 | Page 10 of 26 | | Version 4 |

It is the responsibility of every individual to check that this is the latest version/copy of this document



Improved fertility -

- In women of child-bearing age, significant weight loss may restore ovarian function, menstrual cycle regularity and fertility. Menstruating women may require a greater dose of iron supplementation.
- It is generally recommended that pregnancy is avoided for 12 to 18 months postoperatively due to the risk of nutrient deficiencies. Recent bariatric surgery would not be grounds for termination.
- Contraceptive options should be discussed. RYGB may alter the pharmacokinetics of oral contraceptives due to disruption of enterohepatic recirculation. This may result in reduced efficacy although evidence of this is unclear. Since efficacy cannot be monitored like other medicines, it would be prudent to consider barrier methods, implantable contraceptives (medroxyprogesterone acetate), intrauterine device or vaginal rings. Limited evidence suggests these are not influenced by bariatric procedures or significant weight loss.
- Any patient who becomes pregnant in the 18 months after bariatric surgery should be referred to Obstetrics usually under the care of a consultant.

Patients are advised to contact the bariatric team when planning a pregnancy or becoming pregnant. Multivitamin and mineral supplements will need to be reviewed and changed to pregnancy suitable options. A full panel of bloods tests will need to be checked including vitamin B12 levels. British Obesity and Metabolic Surgery Society recommend:

- women with BMI <29.9kg m² should take an additional 400micrograms/day folic acid prior to conception and until the 12th week of pregnancy
- Women with type 2 diabetes, or a BMI >30kg/m² should take 5mg folic acid pre-conceptually and for 12 weeks post conception.

| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|--|-----------|
| WAHT-PHA-019 | Page 11 of 26 | | Version 4 |



ADVERSE EFFECTS

Some drugs should be used with caution or avoided in patients who have had bariatric surgery.

Gastrointestinal toxicity

- Drugs which may cause nausea, vomiting, diarrhoea, reflux, gallstones, ulcers or obstructions should be used with caution or avoided where possible.
- Non-steroidal anti-inflammatory drugs (NSAIDs) increase the risk of marginal ulcer 11-fold. A
 marginal ulcer occurs in the duodenal lining and could be detrimental to the integrity of the
 surgical pouch. Avoid NSAIDs if possible paracetamol <u>+</u> codeine may be considered. Use
 caution with low-dose aspirin and COX-2 selective inhibitors.
- Bismuth salicylate should be avoided in the early postoperative period due to formation of black stools which may mask malaena.
- PPIs are used for gastroprotection, but there is little evidence for their use post-bariatric surgery.
- Drugs known to cause oesophagitis or acid reflux should be avoided where possible. These include doxycycline, bisphosphonates such as alendronate (see below), theophylline, nitrates and nifedipine.

Bone protection

- Bisphosphonates are commonly prescribed to offset the increased risk of osteoporosis due to rapid weight loss and/or calcium malabsorption. However, oral bisphosphonates have the potential to cause serious damage if lodged in the oesophagus and should be avoided.
- Consider early bone densitometry and check serum parathyroid hormone, total calcium and 25-hydroxyvitamin D levels.
- If bisphosphonate therapy is required, then intravenous route of administration is preferred.
- All RYGB/LSG patients should take calcium and vitamin D supplements (see below). Where possible minimise medication which may lower calcium, such as loop diuretics and carbamazepine.
- Glucosamine can cause nausea, vomiting and epigastric discomfort while chondroitin is better tolerated.

| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|--|-----------|
| WAHT-PHA-019 | Page 12 of 26 | | Version 4 |

WAHT- PHA-019 It is the responsibility of every individual to check that this is the latest version/copy of this document



Simple sugars –

- Dumping syndrome occurs in around 75% of RYGB patients. This involves rapid gastric transit with mostly-undigested food entering the small intestine, leading to abdominal pain, diarrhoea, light-headedness, flushing, tachycardia and syncope.
- Simple sugars can exacerbate dumping syndrome. The total intake of oral medicines containing sucrose, sorbitol, corn syrup, maltose, fructose, lactose, honey and mannitol should be limited where possible.

Lactose intolerance

- Some patients may develop lactose intolerance post-operatively.
- The lactose content of medication does not usually cause problems, but should be considered in severe intolerance or where single doses exceed 400mg lactose. Liquid preparations are usually lactose-free.

| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|--|-----------|
| WAHT-PHA-019 | Page 13 of 26 | | Version 4 |



NUTRIENT DEFICIENCY

- A dietitian and wider MDT must tailor the nutritional support of every patient to avoid under- or over-supplementation.
- As a minimum, all patients should take a complete multivitamin and mineral supplement indefinitely, e.g. Forceval once daily or two daily Sanatogen A-Z Complete, Superdrug A-Z multivitamins and minerals, Tesco Complete multivitamins and minerals, Lloyds pharmacy A-Z multivitamins and minerals. Supplements should include thiamine, iron, selenium, zinc and copper. Avoid chewable versions after the initial post-operative period as these are generally not complete.
- A minimum of 2mg copper and 15mg zinc per day is recommended following RYGB, LSG and DS patients.

Calcium and Vitamin supplements, iron supplements, and 3 monthly vitamin B12 injections are recommended post SG, RYGB, BPD and DS.

• Life long nutritional monitoring will be needed since deficiencies can develop over a number of years. Suggested monitoring schedules:

| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|--|-----------|
| WAHT-PHA-019 | Page 14 of 26 | | Version 4 |



Postoperative blood tests following bariatric surgery

| Blood test / Procedure | Frequency |
|---|--|
| HbA1c and/or FBG in patients with preoperative diabetes | Monitor as appropriate |
| Lipid profile | Monitor in those with dyslipidaemia |
| U+E, LFT, FBC, ferritin, folate, calcium, vitamin D, PTH | 3, 6 and 12 months in first year then at least annually. If PTH and calcium raised seek specialist guidance to investigate primary hyperparathyroidism |
| Thiamine | Routine blood monitoring of thiamine is not required but clinicians should be aware that patients with prolonged vomiting can develop acute thiamine deficiency, which requires urgent treatment. Also consider supplementation in cases of rapid weight loss, poor dietary intake, alcohol abuse, oedema or neuropathy. Prescribe oral thiamine 200-300mg daily, B co-strong 1 or 2 tablets three times daily |
| Vitamin B12 Patients following SG or RYGB and BPD/ DS | 3, 6 and 12 months in first year then annually |
| Zinc, copper Gastric bypass, SG and BPD/DS only | Annually. Monitor zinc if unexplained anaemia, poor wound healing, hair loss or changes in taste acuity. Monitor copper if unexplained anaemia or poor wound healing. Note the zinc levels affect copper levels and vice versa. Serum copper should be monitored in patients taking zinc supplements and vice versa. |
| Vitamin A BPD/DS only Sleeve and RYGB in pregnancy | Measure every 3 months until stable and then annually for PBD/DS. Measure if concerns regarding steattorrhoea or symptoms of vitamin A deficiency e.g. night blindness Monitor more frequently in pregnancy e.g. each trimester |
| Vitamins E, K Gastric bypass and BPD/DS only | Measure vitamin E if unexplained anaemia, neuropathy. Measure Vitamin K1 & PIVKA levels annually post BPS/DS |

| Guidelines for medici | ines management follow | wing bariatric surgery | |
|-----------------------|------------------------|------------------------|-----------|
| WAHT-PHA-019 | Page 15 of 26 | | Version 4 |

It is the responsibility of every individual to check that this is the latest version/copy of this document



| | coagulopathy as may indicate vitamin K deficiency |
|--|--|
| Selenium Gastric bypass and BPD/DS only | Monitor if unexplained fatigue, anaemia, metabolic bone disease, chronic diarrhoea or heart failure |
| Magnesium | Routine monitoring not needed but those with hypocalcaemia should be investigated for hypomagnesaemia and treated prior to calcium Supplementation. |

Operations are a second as INID 16 second as the low state of /

General considerations – not an exhaustive list:

Calcium and vitamin D

- Calcium deficiency after RYGB/LSG is common, increasing the risk of fracture. Calcium carbonate is poorly absorbed due to increased stomach pH post-operatively.
- All patients should take calcium with vitamin D3 long-term e.g. Calci-D Chewable one once a day. Titrate the dose to serum calcium and vitamin D plasma levels. If patients are taking a separate vitamin D supplement use calcium supplement only (i.e. not combination). Calcium supplements may also reduce the absorption of certain medicines, advice will be provided by the pharmacist.
- In patients who remain hypocalcaemic, use of calcium citrate (1200-1500mg/day) may be indicated as evidence exists that this is better absorbed than calcium carbonate in RYGB patients. Vitamin D supplementation will also be required.
- Patients identified as vitamin D deficient should be managed in line with the National Osteoporosis Society Guidelines: Vitamin D and bone health: A Practical Clinical Guideline for Patient Management. In people with severe vitamin D deficiency, high dose vitamin D injections might be required, which should be given following specialist consultation.
- Give at least 2 hours before or after iron or phosphate doses.

Iron

- Iron-deficiency anaemia occurs in up to 50% of RYGB patients, particularly premenopausal women.
- For SG, RYGB, BPD and DS patients, prescribe prophylactic supplementation with 200mg ferrous sulphate, 210mg ferrous fumarate, or 300mg ferrous gluconate once a day and twice a day in menstruating women. Fersamal (ferrous fumarate) syrup 5mL can be prescribed for patients not tolerating tablets.
- Advise patients to take iron and calcium supplements at least two hours apart as one may inhibit the absorption of the other.

| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|--|-----------|
| WAHT-PHA-019 | Page 16 of 26 | | Version 4 |

It is the responsibility of every individual to check that this is the latest version/copy of this document



- If oral supplements are not tolerated or anaemia persists, consider IV iron supplementation.
- For people over 12 years old and pregnant women diagnosed with iron deficiency anaemia, treat iron deficiency following NICE CKS Anaemia-iron deficiency

Vitamin B12 –B12-deficiency after SG, RYGB, BPD and DS is likely as absorption relies on stomach acid and intrinsic factor. Give hydroxocobalamin IM injection 1mg every 3 months to maintain normal range levels. Monitor Hb and mean corpuscular volume. Treat Vitamin B12 deficiency immediately using NICE CKS: Anaemia-B12 and folate deficiency

Folate – patients should choose a multivitamin preparation containing the recommended daily intake of 400 to 800 micrograms folic acid. If deficient check compliance with multivitamins and minerals. If compliant check for Vitamin B12 deficiency before recommending additional folic acid supplementation. Treat folic acid deficiency using NICE CKS Anaemia-B12 and folate deficiency. Oral folic acid 5mg daily should be given for a minimum of 4 months. Recheck in 4 months. Additional supplementation may be required due to increased requirements for preconceptual care, pregnancy and lactation.

Vitamin K – Deficiency may alter oral anticoagulant control. For all patients, check the INR if the patient experiences excessive bruising or bleeding and supplement if needed.

Zinc and copper – Forceval contains sufficient zinc and copper for supplementation. However if the patient elects to take an alternative preparation, ensure that the patient is taking 2mg of copper and 15mg of zinc each day.

Selenium - A complete multivitamin and mineral supplement, which contains selenium, should be sufficient to meet needs after bariatric surgery. If additional selenium is required, patients may prefer to eat two to three Brazil nuts a day as these are a rich source of selenium. Check A-Z supplement contains selenium.

Future admissions – consider nutrient deficiencies as a cause of presenting symptoms, eg bleeding due to Vitamin K deficiency, encephalopathy due to Vitamin B deficiency. Unexplained anaemia, poor wound healing, hair loss, neutropaenia, peripheral neuropathy or cardiomyopathy may be symptoms of zinc, copper or selenium deficiency and so levels should be checked if there are any concerns. In patients who present with neurological symptoms, treat with thiamine, check for Vitamin B12, copper, and vitamin E deficiencies and treat. Refer to neurologist and haematologist.

| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|--|-----------|
| WAHT-PHA-019 | Page 17 of 26 | | Version 4 |

| WAHT- PHA-019 | |
|---|-----------|
| It is the responsibility of every individual to check that this is the latest version/cop | y of this |



| Please attach patient sticker here or record: |
|---|
| Name: |
| NHS No: |
| Hosp No: |
| D.O.B:// Male Female |
| Consultant: Ward: |
| |

| Worcestershire | NHS |
|---------------------------|-----|
| Acute Hospitals NHS Trust | |

CHECKLIST FOR MEDICINES OPTIMISATION IN INPATIENTS FOLLOWING BARIATRIC SURGERY

To be completed by responsible clinician within 24 hours of surgery and filed in patient notes.

Inpatient has been prescribed:

| Review medication for a form the patient is able to swallow |
|---|
| > Antiemetics |
| Gastroprotection (e.g. lansoprazole orodispersible 30mg OD) |
| |
| Enoxaparin as appropriate (see VTE assessment/Op note) |
| Multivitamin + mineral supplement 1 OD (Patients own) |
| Calci-D chewable 1 OD (or calcium citrate with vitamin D) |
| Ferrous sulphate 200mg OD (or fumarate syrup 5mL bd) |
| Hydroxocobalamin 1mg IM 3/12 added to EDS for GPs to initiate |
| |
| Improved fertility and contraceptive options discussed (women only) |

| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|-----|--------|
| WAHT-PHA-019 | Page 18 of 26 | Ver | sion 4 |

It is the responsibility of every individual to check that this is the latest version/copy of this document



MONITORING TOOL

This should include realistic goals, timeframes and measurable outcomes.

How will monitoring be carried out?

Who will monitor compliance with the guideline?

| STANDARDS | % | CLINICAL | Person responsible |
|--------------------------|-------|-------------------------|--------------------|
| | | EXCEPTIONS | |
| All patients planned for | | | |
| bariatric surgery will | 100% | Nono | Emma White |
| have a full dietetic | 100 % | NOTE | |
| review and follow up | | | |
| All bariatric surgery | | Patient stay that falls | |
| patients will have a | 009/ | Patient Stay that fails | Kaith Hinton |
| medication review by a | 90% | | |
| pharmacist | | Fliday ward Service. | |

REFERENCES

- 1. Chan LN. Drug therapy-related issues in patients who received bariatric surgery (part I). *Pract Gastroenterol* 2010;7:26-32
- 2. Chan LN. Drug therapy-related issues in patients who received bariatric surgery (part II). *Pract Gastroenterol* 2010;8:24-32
- 3. Fujioka K, DiBaise JK, Martindale RG. Nutrition and metabolic complications after bariatric surgery and their treatment. *J Parenter Enter* 2011;35 Suppl 1:52S-59S
- Heber D, Greenway FL, Kaplan LM, Livingston E, Salvador J, Still C. Endocrine and nutritional management of the post-bariatric surgery patient: an Endocrine Society clinical practice guideline. J *Clin Endocrin Metab.* 2010;95(11);4823-4843.
- 5. Malone M, Alger-Mayer SA. Medication use patterns after gastric bypass surgery for weight management. *Ann Pharmacother* 2005;39:637-642
- 6. McEvoy G, editor. AHFS Drug Information 2011 [Internet]. Bethesda, USA: American Society of Health-System Pharmacists Inc; 2012. [accessed INSERT DATE] Available from: <u>www.medicinescomplete.com</u>
- 7. Miller AD, Smith KM. Medication and nutrient administration considerations after bariatric surgery. *Am J Health-Syst Pharm.* 2006;63:1852-1857.

| Guidelines for medici | nes management follow | wing bariatric surgery | |
|-----------------------|-----------------------|------------------------|-----------|
| WAHT-PHA-019 | Page 19 of 26 | | Version 4 |

It is the responsibility of every individual to check that this is the latest version/copy of this document



- 8. Miller AD, Smith KM. Problems after bariatric surgery. Am J Health-Syst Pharm 2007;64:241
- 9. Padwal R, Brocks D, Sharma AM. A systematic review of drug absorption following bariatric surgery and its theoretical implications. *Obes Rev* 2010;11:41-50
- 10. Sardo P, Walker JH. Bariatric surgery: impact on medication management. *Hosp Pharm* 2008;43(2):113-120
- 11. Smith A, Henriksen B, Cohen A. Pharmacokinetic considerations in Roux-en-Y gastric bypass patients. *Am J Health-Syst Pharm* 2011;68:2241-2247
- Tandra S, Masters AR, Jones DR, Mattar SG, Flockhart DA, Hall SD *et al.* Effects of roux-en-Y gastric bypass surgery on the metabolism of the orally administered medications. *Gastroenterology* 2011;140(5):S285
- Tandra S, Mattar SG, Jones DR, Flockhart DA, Hall SD, Chalasani NP *et al.* Effect of roux-en-Y gastric bypass on the pharmacodynamic response to orally administered drugs. *Gastroenterology* 2011;140(5):S286
- 14. Thomas JA. Problems after bariatric surgery. Am J Health-Syst Pharm 2007;64:241
- 15. UK Clinical Pharmacy Association. What doses of thromboprophylaxis are appropriate for adult patients at extremes of body weight? Q & A 326.1. April 2010.
- 16. Mechanick JI et al. Clinical Practice Guidelines for the Perio-operative Nutritional, Metabolic, and Nonsurgical Support of the Bariatric Surgery Patient – 2013 Update: Cosponsored by the American Association of Clinical Endocrinologists, The Obesity Society and the American Society of Metabolic & Bariatric Surgery. Surgery for Obesity and Related Diseases 2013 (9): 159-191.
- 17. Francis R, Aspray T, Fraser W, Gittoes N, Javaid K, MacDonald H et al. Vitamin D and bone health: A practical clinical guideline for patient management. National Osteoporosis Society [Internet]. 2013 Available from: <u>http://www.nos.org.uk/document.doc?id=1352</u>
- Busetto et al.: Practical Recommendations of the Obesity Management Task Force of the European Association for the Study of Obesity for the Post-Bariatric Surgery Medical Management. Obes Facts 2017;10:597-632. Available from https://www.karger.com/Article/FullText/481825
- O'Kane M, Parretti HM, Pinkney J, et al. British Obesity and Metabolic Surgery Society Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery—2020 update. Obesity Reviews. 2020;21: e13087. <u>https://doi.org/10.1111/obr.13087</u>
- 20. Consilient Health Ltd. Summary of Product Characteristics. Calci-D 1000mg/1000unit chewable tablets. October 2021. [accessed 11/08/2022] | Available from: <u>https://products.mhra.gov.uk/</u>
- 21. Herefordshire and Worcestershire Area Prescribing Committee. Herefordshire and Worcestershire Formulary. Vitamin D and analogues (systemic). 2022. [accessed 11/08/2022] | Available from: <u>https://www.hereworcsformulary.nhs.uk/</u>

| Guidelines for medici | nes management follow | wing bariatric surgery | |
|-----------------------|-----------------------|------------------------|-----------|
| WAHT-PHA-019 | Page 20 of 26 | | Version 4 |



CONTRIBUTION LIST

Key individuals involved in developing the document

| Name | Designation |
|--------------|---|
| Keith Hinton | Team Lead Pharmacist, Surgery and Critical Care |
| Chris Parry | Senior Pharmacist (Surgery AH) |

Circulated to the following individuals for comments

| Name | Designation |
|------------------------------|--|
| Martin Wadley | Consultant Surgeon |
| Emma White | Bariatric Specialist Dietitian |
| Anthony Perry | Clinical Lead Upper GI Surgery |
| John Robinson | Consultant Surgeon |
| Karen Abolghasemi-Malekabadi | Clinical nurse specialist, bariatric surgery |
| Penny Lock-Pullan | Specialist weight management Dietitian |
| Sue Rogers | Diabetes Specialist Nurse |
| David Jenkins | Consultant Physician (Diabetes) |

Circulated to the following CD's/Heads of dept for comments from their directorates / departments

| Name | Directorate / Department |
|---------------|--------------------------------|
| Anthony Perry | Clinical Lead Upper GI Surgery |

Circulated to the chair of the following committee's / groups for comments

| Name | Committee / group |
|--------------------|--|
| Rachael Montgomery | Deputy Director of Pharmacy |
| Nick Purser | CD for Clinical Governance & Quality Improvement |
| | (Surgical Division) |

| Guidelines for medici | nes management follow | wing bariatric surgery | |
|-----------------------|-----------------------|------------------------|-----------|
| WAHT-PHA-019 | Page 21 of 26 | | Version 4 |

WAHT- PHA-019 It is the responsibility of every individual to check that this is the latest version/copy of this document







Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

| Herefordshire & Worcestershire STP | | Herefordshire Council | Herefordshire CCG | |
|---|---|----------------------------------|----------------------|--|
| Worcestershire Acute Hospitals NHS Trust | ~ | Worcestershire County Council | Worcestershire CCGs | |
| Worcestershire Health and Care NHS Trust | | Wye Valley NHS Trust | Other (please state) | |

| Name of Lead for Activity | Keith Hinton |
|---------------------------|--------------|
| | |

| Details of individuals completing this assessment | Name Keith Hinton | Job title Pharmacist | e-mail contact keith.hinton1@nhs.net |
|--|----------------------|-------------------------|---|
| Date assessment completed | 14.10.2020 | | |

Section 2

| Activity being assessed (e.g. policy/procedure, document, service redesign, policy, strategy etc.) | Title GUID SUR(| Title: GUIDELINE FOR MEDICINES MANAGEMENT FOLLOWING BARIATRIC SURGERY | | | | |
|--|---|---|--------|----------------------|--|--|
| What is the aim, purpose and/or intended outcomes of this Activity? | This guideline covers medication issues in adult patients following bariatric surgery. It describes practical recommendations for medicines management together with monitoring and supplementation advice to prevent nutrient deficiencies. | | | | | |
| Who will be affected by the development & implementation | \checkmark | Service User | ✓ □ | Staff Communities | | |
| of this activity? | | Carers Visitors | ā | Other | | |
| Is this: | Review of an existing activity New activity Planning to withdraw or reduce a service, activity or presence? | | | | | |

| Guidelines for medicines management following bariatric surgery | | | | |
|---|---------------|--|-----------|--|
| WAHT-PHA-019 | Page 22 of 26 | | Version 4 | |

It is the responsibility of every individual to check that this is the latest version/copy of this document



| What information and evidence have you reviewed to help inform this assessment? (Please name sources, eg demographic information for patients / services / staff groups affected, complaints etc. | See reference list |
|--|--|
| Summary of engagement or consultation undertaken (e.g. who and how have you engaged with, or why do you believe this is not required) | See contribution list (i.e. service users) |
| Summary of relevant findings | |

Section 3

Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. **Please tick one or more impact box below for each Equality Group and explain your rationale**. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g. staff, public, patients, carers etc. in these equality groups.

| Equality Group | Potential | Potential | Potential | Please explain your reasons for any |
|---|-----------------|----------------|-----------------|--|
| | <u>positive</u> | <u>neutral</u> | <u>negative</u> | potential positive, neutral or negative impact |
| | impact | impact | impact | identified |
| Age | | ~ | | |
| Disability | | ✓ | | |
| Gender Reassignment | | ~ | | |
| Marriage & Civil Partnerships | | ✓ | | |
| Pregnancy & Maternity | ~ | | | Additional advice may prevent maternal iron deficiency anaemia and foetal neural tube defects. |
| Race including Traveling Communities | | ✓ | | |
| Religion & Belief | | ~ | | |
| Sex | | ~ | | |
| Sexual Orientation | | \checkmark | | |
| Other Vulnerable and Disadvantaged Groups (e.g. carers; care leavers; homeless; | | ~ | | |

| Guidelines for medicines management following bariatric surgery | | | | |
|---|---------------|--|-----------|--|
| WAHT-PHA-019 | Page 23 of 26 | | Version 4 | |

It is the responsibility of every individual to check that this is the latest version/copy of this document



| Equality Group | Potential <u>positive</u> impact | Potential <u>neutral</u> impact | Potential negative impact | Please explain your reasons for any potential positive, neutral or negative impact identified |
|--|--|---------------------------------------|---------------------------------|---|
| Social/Economic deprivation, travelling communities etc.) | | | | |
| Health | | ✓ | | |
| Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies) | | | | |

Section 4

| What actions will you take to mitigate any potential negative impacts? | Risk identified | Actions required to reduce / eliminate negative impact | Who will lead on the action? | Timeframe |
|--|-----------------|---|---------------------------------------|-----------|
| | | | | |
| | | | | |
| | | | | |
| How will you monitor these actions? | | | • | |
| When will you review this | | | | |
| EIA? (e.g in a service redesign, this EIA should be revisited regularly throughout the design & implementation) | | | | |

Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation

1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.

1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carer's etc, and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

| Signature of person | Keith Hinton |
|---------------------|--------------|
| completing EIA | |

| Guidelines for medicines management following bariatric surgery | | | | |
|---|---------------|--|-----------|--|
| WAHT-PHA-019 | Page 24 of 26 | | Version 4 | |

It is the responsibility of every individual to check that this is the latest version/copy of this document



| 14.10.2020 |
|------------|
| |
| |
| |
| |
| |
| |
| |
| |



| Guidelines for medicines management following bariatric surgery | | | |
|---|---------------|--|-----------|
| WAHT-PHA-019 | Page 25 of 26 | | Version 4 |

It is the responsibility of every individual to check that this is the latest version/copy of this document



Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

| | Title of document: | Yes/No |
|----|--|--------|
| 1. | Does the implementation of this document require any additional Capital resources | No |
| 2. | Does the implementation of this document require additional revenue | No |
| 3. | Does the implementation of this document require additional manpower | No |
| 4. | Does the implementation of this document release any manpower costs through a change in practice | No |
| 5. | Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff | No |
| | Other comments: | |

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval

| Guidelines for medici | nes management follow | wing bariatric surgery | |
|-----------------------|-----------------------|------------------------|-----------|
| WAHT-PHA-019 | Page 26 of 26 | | Version 4 |