

Table 4 Postoperative vitamin and mineral supplementation

Postoperative vitamin and mineral supplementation	Grade, Evidence level (EL), (Range of evidence)
<b>Recommendations</b>	
<ul style="list-style-type: none"> <li>Vitamin and mineral supplements should be reviewed regularly and adjusted accordingly</li> </ul>	<b>GPP</b>
<ul style="list-style-type: none"> <li>A complete multivitamin and mineral supplement (containing thiamine, iron, selenium, zinc and copper) is recommended daily after all bariatric procedures</li> </ul>	<b>GPP</b>
<b>Iron</b> <ul style="list-style-type: none"> <li>Following AGB, consider recommending a multivitamin and mineral supplement containing iron to people, especially adolescents, as oral dietary intake of iron may be low</li> <li>Following SG, RYGB or malabsorptive procedures such as BPD/DS, recommend that people take additional elemental iron</li> <li>Consider starting with 200 mg ferrous sulphate, 210 mg ferrous fumarate or 300 mg ferrous gluconate daily and twice daily in menstruating women and adjust depending on blood results</li> <li>Consider advising people to take iron supplements with citrus fruits/drinks or vitamin C</li> <li>Consider advising people to take calcium and iron two hours apart as one may inhibit absorption of the other</li> </ul>	<b>GPP</b>  <b>Grade B EL 2 (1+ to 2-)</b>  <b>Grade B EL 2 (1+ to 2-)</b>  <b>GPP</b> <b>GPP</b>
<b>Folic acid</b> <ul style="list-style-type: none"> <li>Advise people to take a complete multivitamin and mineral supplement providing 400 to 800 micrograms folic acid /day</li> </ul>	<b>Grade D EL 4 (1+ to 4)</b>
<b>Vitamin B12</b> <ul style="list-style-type: none"> <li>Following SG, RYGB or malabsorptive procedures such as BPD/DS, recommend routine supplementation with vitamin B12 intramuscular injections</li> <li>Following SG, RYGB or malabsorptive procedures such as BPD/DS, recommended frequency of vitamin B12 intramuscular injections is every three months</li> </ul>	<b>Grade B level 2 (1+ to 2-)</b>  <b>GPP</b>
<b>Calcium and vitamin D</b> <b>Vitamin D</b> <ul style="list-style-type: none"> <li>Adjust vitamin D3 supplementation to maintain serum 25-hydroxyvitamin D levels of 75 nmol/L or higher.</li> <li>Maintenance levels of between 2000 to 4000 IU oral vitamin D3 /day may be required following SG and RYGB and higher following malabsorptive procedures such as BPD/DS</li> </ul> <b>Calcium</b>	<b>Grade D EL 4 (2 to 4)</b> <b>Grade D EL 4 (2 to 4)</b>

<ul style="list-style-type: none"> <li>• Ensure good dietary calcium intake, recognising that requirements may be higher in individuals who have SG, RYGB or malabsorptive procedures such as BPD/DS. If PTH is raised, despite adequate serum 25-hydroxyvitamin D levels and calcium is normal then consider a combined vitamin D and calcium supplement</li> <li>• To aid calcium absorption, advise that calcium taken as equally divided doses; calcium carbonate with food; calcium citrate with or without food</li> <li>• Calcium citrate may be the preferred supplement for people at risk of developing kidney stones</li> </ul>	<p><b>GPP</b></p> <p><b>GPP</b></p> <p><b>GPP</b></p>
<p><b>Vitamins A, E and K</b></p> <p><b>Vitamin A</b></p> <ul style="list-style-type: none"> <li>• Following bariatric surgery, recommend that individuals take a complete multivitamin and mineral supplement containing UK government dietary recommendations for vitamin A</li> <li>• Following RYGB, especially in people, consider that some may require additional routine oral vitamin A supplementation, especially if symptoms such as deterioration in night vision and dry eyes are present</li> <li>• Following malabsorptive procedures such as BPD/DS, recommend daily supplementation with additional oral vitamin A</li> <li>• Following malabsorptive procedures such as BPD/DS, we suggest starting at 10000 IU (3000 micrograms) oral vitamin A daily and adjust as necessary</li> </ul> <p><b>Vitamin E</b></p> <ul style="list-style-type: none"> <li>• Following malabsorptive procedures such BPD/DS, recommend daily oral supplementation with additional vitamin E</li> <li>• Following malabsorptive procedures such BPD/DS, we suggest starting with 100 IU oral vitamin E daily and adjust as necessary</li> </ul> <p><b>Vitamin K</b></p> <ul style="list-style-type: none"> <li>• Following malabsorptive procedures such BPD/DS, recommend daily oral supplementation with additional vitamin K</li> <li>• Following malabsorptive procedures such BPD/DS, we suggest starting with 300 micrograms oral vitamin K daily</li> </ul> <p><b>Water-miscible forms of fat-soluble vitamins</b></p> <ul style="list-style-type: none"> <li>• Water-miscible forms of fat-soluble vitamins may improve absorption especially after malabsorptive procedures</li> </ul>	<p><b>GPP</b></p> <p><b>Grade C EL 2 (1- to 4)</b></p> <p><b>Grade B EL 2 (1+ to 3)</b></p> <p><b>GPP</b></p> <p><b>Grade C EL 2 (1+ to 4)</b></p> <p><b>GPP</b></p> <p><b>Grade C EL 2 (1+ to 4)</b></p> <p><b>GPP</b></p> <p><b>Grade D EL 4</b></p>
<p><b>Zinc and copper</b></p> <ul style="list-style-type: none"> <li>• Recommend a multivitamin and mineral containing at least the government recommended daily allowance for zinc</li> </ul>	<p><b>Grade B EL 2</b></p>

<ul style="list-style-type: none"> <li>• Following RYGB and SG, the optimal level of zinc supplementation is not known, however we recommend 15 mg zinc oral daily which may be contained within the multivitamin and mineral supplement</li> <li>• Following malabsorptive procedures such as BPD/DS, the optimal level of zinc supplementation is not known but will be higher than that for RYGB or SG. We recommend starting with at least 30 mg oral zinc daily which may be contained within the oral multivitamin and mineral supplement</li> <li>• Following RYGB, SG and BPD/DS, recommend complete multivitamin and mineral oral supplement containing 2 mg copper</li> </ul>	<p><b>GPP</b></p> <p><b>Grade C EL 2</b></p> <p><b>Grade D EL 4</b></p>
<p><b>Selenium</b></p> <ul style="list-style-type: none"> <li>• Recommend a complete multivitamin and mineral supplement containing selenium</li> <li>• Following malabsorptive procedures such as BPD/DS, additional routine oral supplementation with selenium may be needed to prevent deficiency</li> </ul>	<p><b>Grade D EL 2 (2-)</b></p> <p><b>Grade B EL 2 (1+ to 2-)</b></p>
<p><b>Thiamine</b></p> <ul style="list-style-type: none"> <li>• Recommend a complete multivitamin and mineral supplement containing at least government dietary recommendations for thiamine</li> <li>• Consider recommending oral thiamine or vitamin B co strong tablets for first three to four months post-surgery</li> <li>• Prescribe oral thiamine 200–300 mg daily, vitamin B co strong 1 or 2 tablets, three times a day to people with symptoms such as dysphagia, vomiting, poor dietary intake or fast weight loss</li> <li>• Clinicians should be educated about the factors which may predispose to thiamine deficiency and the importance of initiating immediate treatment</li> <li>• People should be educated about the risks of potential thiamine deficiency and asked to seek early advice if they experience prolonged vomiting or poor dietary intake</li> </ul>	<p><b>Grade B EL 2</b></p> <p><b>GPP</b></p> <p><b>Grade D EL 4</b></p> <p><b>GPP</b></p> <p><b>GPP</b></p>

EL =Evidence level and depicts where the majority of evidence lies. GPP = Good practice point. AGB= adjustable gastric band (AGB), SG=sleeve gastrectomy (SG), RYGB = Roux-en-y gastric bypass, BPD/DS=duodenal switch

