

Practical recommendations for the post-bariatric surgery medical management

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3.1.8. Das multidisziplinäre bariatrische Team ist verpflichtet, alle bariatrischen Patienten lebenslang nach zu kontrollieren.

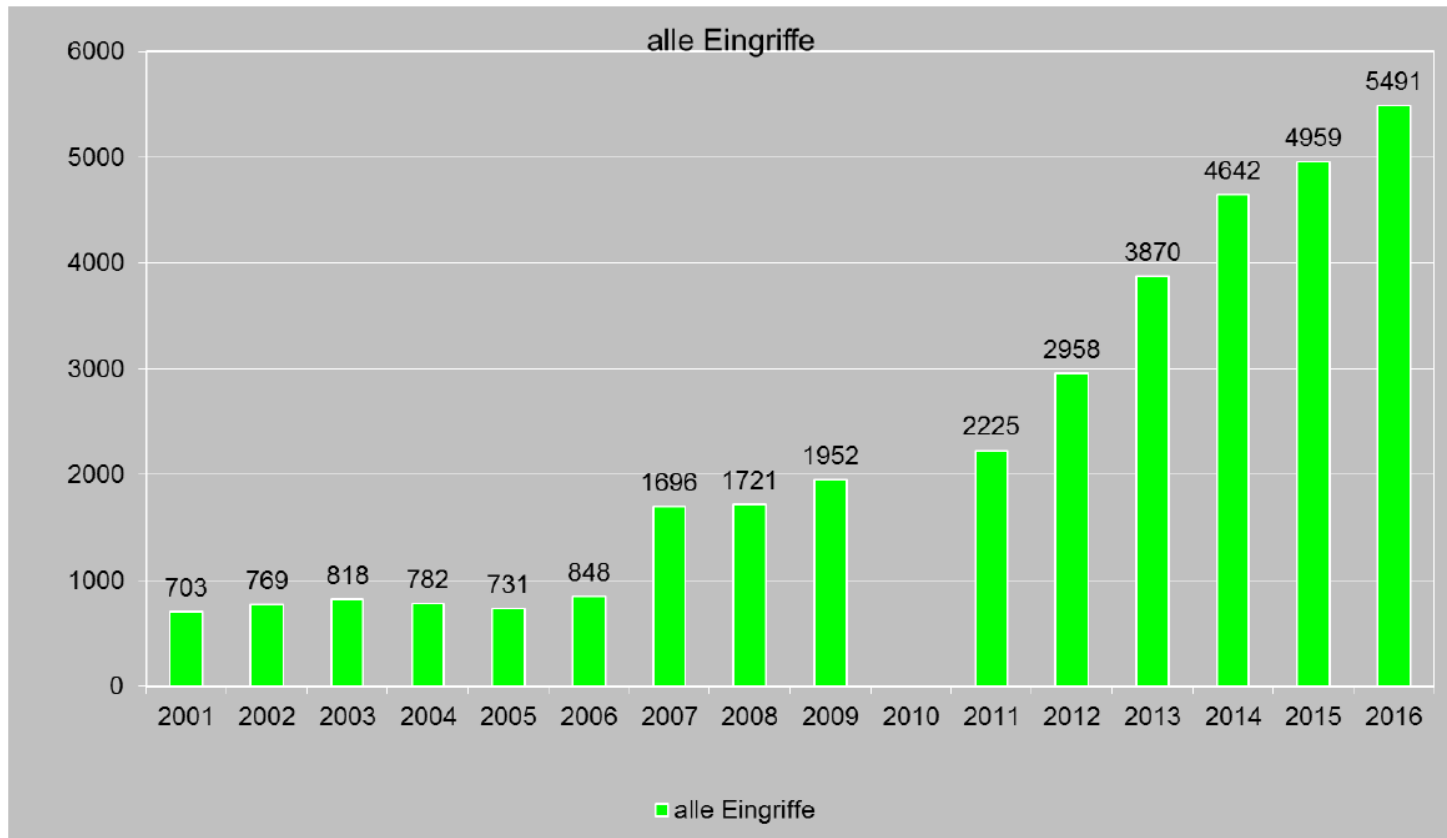
3.2.4. Das anerkannte bariatrische Zentrum stellt eine Nachbetreuungsrate von mindestens 75% seiner Patienten über minimal 5, bei jugendlichen Patienten <18 minimal 10 Jahre sicher.

3.1.8 L'équipe multidisciplinaire a l'obligation de suivre les malades à vie après l'intervention chirurgicale selon les directives SMOB. Le suivi peut différer d'un cas à l'autre en fonction de l'intervention réalisée, mais doit être unitaire pour une opération donnée.

3.2.4 Les centres reconnus doivent pouvoir faire état d'un taux documenté de suivi des malades par les membres de l'équipe multidisciplinaire d'au minimum 75% à 5 ans.

- **Multidisciplinary long-term follow-up is recommended after bariatric surgery and the provision of an adequate follow-up program is mandatory for bariatric centers.**
- Any time, a patient can be redirected to team that had prepared and operated him.

2011-2016: 24145 Eingriffe



Giving the accumulating numbers of bariatric patients, follow-up should be at least in part transferred to primary care over time

- There is a growing need for dissemination of first-level knowledge in managing bariatric patients
- The aim of this presentation is therefore to **provide a brief but comprehensive review** of the major practical recommendations for post-bariatric surgery medical management
- **Referral to bariatric multidisciplinary center**, preferably the one performing the original procedure, should be considered in case of **more complex clinical situations**

Guidelines for nutritional management post-bariatric surgery

- **AACE/TOS/ASMBS:** Clinical Practice Guidelines for the Perioperative Nutritional, Metabolic, and Nonsurgical Support of the Bariatric Surgery-2013 Update. *Surg Obes Relat Dis*; 9 (2013) 159-191
- **ASMBS:** American Society for Metabolic and Bariatric Surgery Integrated Health Nutritional Guidelines for the Surgical Weight Loss Patients 2016 Update: Micronutrients. *Surg Obes Relat Dis*; 13 (2017) 727-741
- Endocrine and Nutritional Management of the post-bariatric surgery patient. **An Endocrine Society Clinical Practice Guideline.** *JCEM* 2010, 95, 4823-4843
- Practical recommendations of the Obesity Management Task Force of the **EASO** for the Post-Bariatric Surgery Medical Mx. *Obesity Fact.* 2017,



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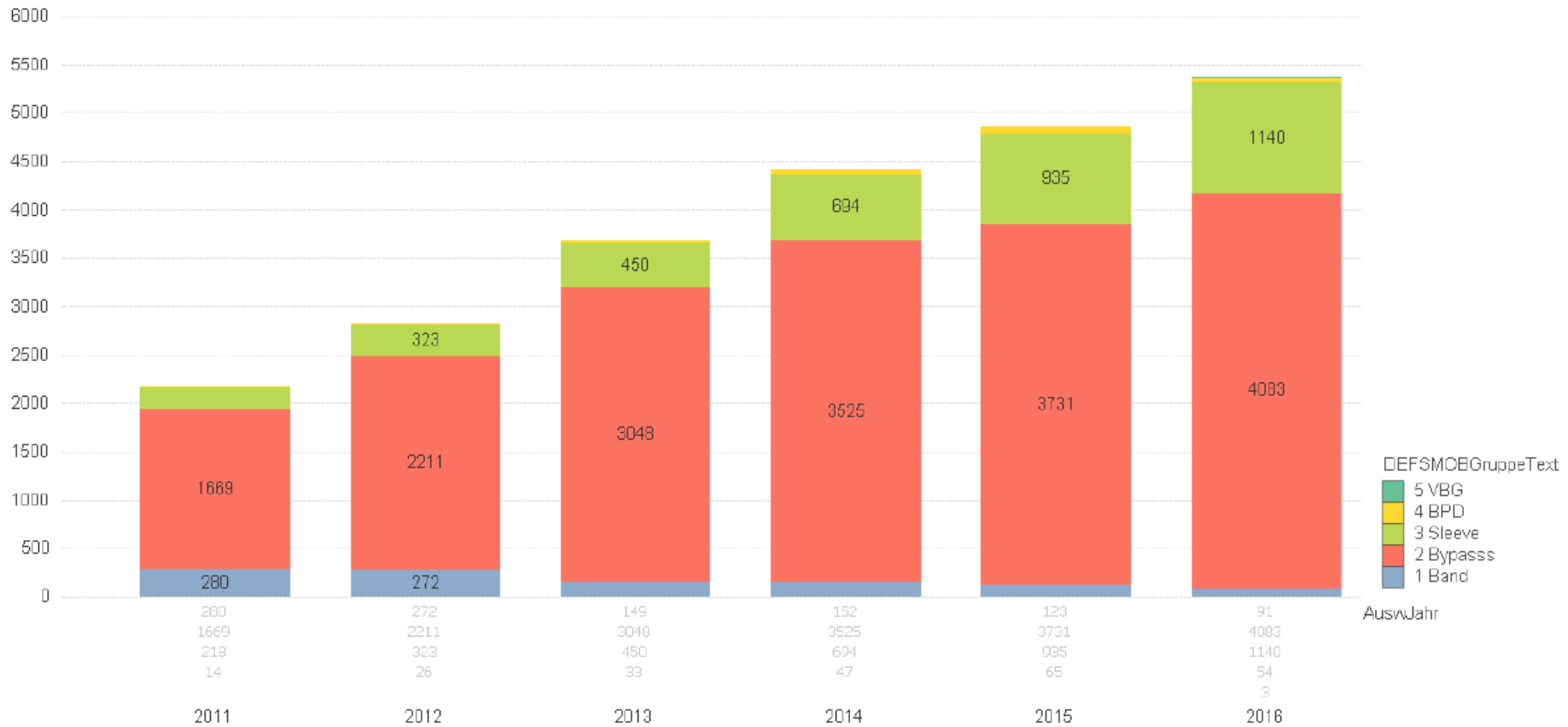


Plan

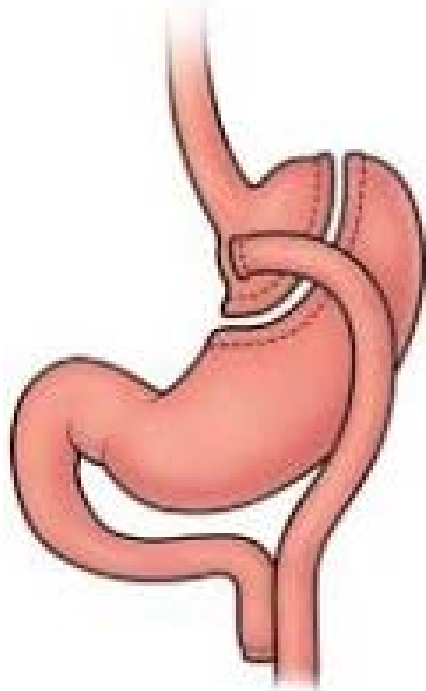
1. Micronutrient supplementation
2. Management of co-morbidities
3. Contraception and Pregnancy
4. Pharmacotherapy after bariatric surgery
5. Psychological aspects

Micronutrient supplementation

- The occurrence of vitamin and mineral deficiencies is one of the most common problems after bariatric surgery
- The anatomical characteristics and the mechanisms of action of the various procedures mostly dictate the frequency and severity of vitamin and mineral deficiencies
- However, **the occurrence of nutritional deficits is influenced by factors independent from the surgical technique :**
 - Regular and nutrient-dense food intake
 - Adherence with post-operative mineral and supplementation

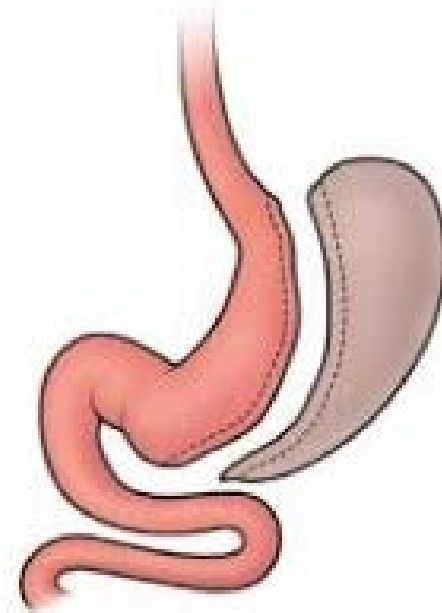


RYGP



- Primary sites of absorption are bypassed (duodenum and proximal jejunum)
- Reduced gastric acid and intrinsic factor secretion

Sleeve Gastrectomy



- Accelerated gastric emptying => faster gastrointestinal passage promote nutrient deficiencies
- Reduced gastric acid secretion and intrinsic factor secretion

In this presentation, we suggest the same recommendations for the medical management after these two surgeries.

Future data will eventually suggest different recommendations

Multivitamin + Mineral

Minimal daily nutritional supplementation should include:

1. One multivitamin plus mineral supplements containing

- Folic acid 400 ug
- Thiamine (vitamin B1)

2. Calcium supplement 1000 mg/d with vitamin D min 800 Ui/d

However, **this is not sufficient to ensure adequate supplementation** and a biochemical monitoring for micro- and macro-nutritional deficiencies after bariatric surgery is recommended annually

Minimal periodic surveillance for nutritional deficiencies after bariatric surgery

	1x/year	Pre-conceptual / Pregnancy
Complete blood count	X	X
Electrolytes, Creatinine	X	X
Glucose, HbA1c	X	X
Liver function tests	X	X
Albumin / prealbumin	X	X
Ferritin	X	X
Vitamin B12	X	X
Vitamin B9 (Folate)	Particular attention to female patients of childbearing age	X
Vitamin B1 (Thiamin)	Particular attention to patients with GI symptoms (nausea, vomiting, rapid weight loss)	X
25-OH-vitamine D, Ca, PTH, P	X	X
Zinc	X	X
Vitamin B2, B6	optional	X
Vitamin A, E, K	optional	X
Copper, Selenium	optional	X

The type and frequency of monitoring not only reflect the bariatric procedure but also the need of individual patients.

Vitamin B₁₂

- Very common
- Cobalamin stores are usually high and vitamin B₁₂ deficiency is therefore rare in the first year after surgery, but tends to increase with time
- Factors :
 - Decreased acid production in the stomach
 - Reduced secreting of intrinsic factor
 - Reduced meal consumption
- Untreated vitamin B12 deficiency may result in irreversible neuropathy
- Treatment first phase
 - Intranasal 500ug/push, 1-3 times/week
 - Parenteral 1'000 ug /1-4 months im

Vitamin B1 _ Thiamine

- Causes:
 - The human body has a low storage for the water-soluble vitamin B1 and can become rapidly devoid without regular and sufficient intake
 - A **short period of persistent vomiting** impairing regular food intake can precipitate thiamine deficiency
- Risk factors:
 - Prolonged post-operative vomiting
 - Excessive alcohol consumption
 - Rapid post-bariatric weight loss
 - Non-compliance with multivitamin supplementation
 - Psychogenic anorexia
- Clinical manifestations:
 - Peripheral neuropathy
 - Wernicke's encephalopathy and Korsakoff's psychoses
 - **13 case reports on Wernicke encephalopathy following Sleeve gastrectomy**
- Prevention:
 - Daily multivitamin
 - Oral or parenteral thiamine supplementation (100 mg/d) should promptly be considered and started in every bariatric patient suffering from persistent vomiting

Iron deficiency

- Common; most frequently in menstruating women
- Factors :
 - Iron absorption occurs mostly in the duodenum and proximal jejunum
 - Absorption is aided by the acid secretion of the stomach
 - Intake in iron-rich foods is reduced
- Treatment first phase
 - Oral Fe²⁺ with vitamin C
 - **Away from calcium supplements (2h)**
- Treatment second phase
 - Parenteral iron administration

Vitamin D

- Causes
 - Vitamin D is a fat-soluble vitamin absorbed preferentially in the jejunum and ileum
 - Obese patients frequently present vitamin D deficiency at baseline
- Prevention
 - Min 800 U of vitamin D oral per day
 - This standard supplementation is frequently insufficient to maintain sufficient vitamin D levels in patients with malabsorption
 - Higher oral or parental doses may be required
 - **Goals:**
 - 25-OH-vitamin D > 30 ng/ml (> 75 nmol/l)
 - PTH < 50 ng/l

Calcium

- Causes
 - Calcium absorption occurs preferentially in the duodenum and proximal jejunum and is facilitated by vitamin D in an acid environment
- Prevention
 - **1'200-2'000 mg/d of elemental calcium** (in diet and supplement doses)
 - Calcium intake is frequently reduced after bariatric surgery (early dumping syndrome)
 - **Min 1'000 mg calcium supplement / day**
 - **Calcium and iron supplements should not be taken at the same time (2h)**
 - It is recognized that calcium citrate in the absence of gastric acid is more bioavailable than calcium carbonate, however, it is not readily available in CH
- In patients with RYGB, bone density measurements DXA may be indicated to monitor for osteoporosis
 - If therapy is indicated, intravenously administered bisphosphonate should be used (concerns about adequate oral absorption and potential anastomotic ulceration with oral)

Vitamins A, E, K, B2, B6, Copper, Selenium

- For the majority of patients, requirements for these vitamins and mineral can usually be met by oral diet and a complete multivitamin and mineral supplement.
- Levels should be checked before and during pregnancy and in case of unexplained symptoms (anemia, fatigue, disturbances in night vision, xerophthalmia, etc.)

Lipid levels

- Lipid levels and need for lipid-lowering medications should be periodically evaluated
 - The effect of weight loss on dyslipidemia is variable and incomplete
 - Lipid-lowering medications should not be stopped unless clearly indicated

Hypertension

- The need for antihypertensive medications should be evaluated repeatedly
 - The effect of weight loss on blood pressure is variable, incomplete and at times transient
 - Caution should be applied when administering diuretics because the combined diuretic effect of the drugs and the operation may cause dehydration

Nonsteroidal anti-inflammatory drugs

- Should be completely avoided after bariatric surgery
 - Have been implicated in the development of anastomotic ulcerations/perforations

Long-Term Post-Operative Diabetes Management

- After the first early post-operative period, standard diabetes guidelines should be followed in the management of patients still requiring pharmacologic anti-diabetic treatment after bariatric surgery
- For patients not requiring glucose-lowering medications after surgery, treatment goals for comorbid conditions and screening for microvascular complications should be the same as those for patients with diabetes ¹
- With prolonged remission (>5 years)
 - treatment goals appropriate for patients without diabetes can be considered
 - Screening for particular complication can be stopped only in the absence of that complication

1. Buse JB, Caprio S, Cefalu WT, et al. How do we define cure of diabetes? Diabetes care 2009;32:2133-5.



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Contraception following bariatric surgery

- Avoid pregnancy for 12-18 months after bariatric surgery
 - The first 12 months after bariatric surgery represent an active catabolic state
- Use of **non-oral** contraceptives
 - Estrogen is absorbed in the upper gastrointestinal tract
 - The efficacy of oral contraceptive pills is not guaranteed after bariatric surgery
 - Caution with Depo Provera (medroxyprogesterone acetate) because of the increased risk of osteoporosis

Pregnancy after bariatric surgery

- Pre-conception care:
 - Screening for nutritional deficiencies
 - Folic acid 400 ug/d in the pre-conception period and up to 5 mg/d according to the folic acid level
- During pregnancy:
 - Micronutrient supplementation is essential
 - Standard multivitamin post bariatric surgery should be substituted by pre-natal multivitamin preparation in order to reduce vitamin A intake (max 5'000 U/d)
 - Laboratory testing at least every trimester
 - Dietary advice with adequate protein intake
 - Weight gain should be in the line with standard recommendations for pre-pregnancy BMI
 - Careful consideration to women with abdominal pain in pregnancy because of this risk of internal herniation exacerbated by increased intra-abdominal pressure from gravid uterus (RYGB+)
 - Women presenting with hyperemesis gravidarum are at increased risk of Wernicke's encephalopathy (consider parenteral vit B1)
- Adequate nutritional supplementations during breastfeeding

Pharmacotherapy after bariatric surgery

- Patients should be closely monitored in order to evaluate long-term safety and efficacy of their drug regimen
- Factors
 - Absorption of drugs is affected
 - Tissue distribution
- Prevention
 - Plasma drug levels should be checked for drugs requiring plasma level control
 - Antipsychotic drugs, anti-depressant
 - Anti-epileptics
 - Anticoagulants
 - Anti-rejections
 - ...

Alcohol abuse

- Bariatric surgery elevates the risk for an alcoholic disease (+ RYGB)
- The prevalence of alcohol use disorder significantly increases in the 2nd year after surgery
- Patient should be educated about the potential effects of bariatric surgery to increase the risk of alcohol use disorder
- Alcohol dependence screening should be part of the routine postoperative clinical care

Risk of suicide

- Several studies demonstrated higher suicide rate among bariatric surgery patients than among the general community
- Careful postoperative psychiatric surveillance

Conclusion

- Bariatric surgery is in general safe and effective, but can cause **new clinical problems** and it is associated with specific diagnostic, preventive and therapeutic needs
- Giving the growing number of post-bariatric patients, an increasing part of the follow-up, **after the early period after surgery**, should be transferred to the primary care physicians
- A post-bariatric multidisciplinary follow-up program should be an integral part of the clinical pathway at centers delivering bariatric surgery and it should be offered to patients requiring it in case of **more complex clinical situations**