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Bariatric surgery patients: Dental considerations

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ABSTRACT

As the rate of obesity climbs in the United States, so does the rate at which people have bariatric surgery. The American Society for Metabolic and Bariatric Surgery (ASMBS) estimates that in 2017 alone, more than 220,000 people had bariatric surgery.¹ Dental clinicians, whether aware of it or not, have likely treated patients who have had this type of surgery. There is a stigma with weight-loss surgery (WLS) that causes some people to keep it private. Unfortunately, presurgical patients are not required to have dental clearance, and they are not educated on preventive dental treatment, including how their postsurgical diet will affect their oral and dental health. This course highlights clinical findings and dental considerations that may present in patients who have had bariatric surgery. The author collected anecdotal evidence through anonymous online surveys completed by postbariatric surgery patients and dental professionals who examine dental experiences from both patient and clinician viewpoints.

EDUCATIONAL OBJECTIVES

At the conclusion of this educational activity, participants will be able to:

1. Define bariatric surgery
2. Describe the different bariatric surgeries
3. Articulate dental considerations with weight-loss-surgery patients
4. Assess pre- and postoperative dental risk factors
5. Identify clinical signs of vitamin deficiency
6. Gain confidence in speaking to patients about bariatric surgery and dental considerations



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WHAT IS BARIATRIC SURGERY?

Obesity has long been a hot topic of discussion among medical professionals. The Centers for Disease Control and Prevention (CDC) has released statistics showing approximately 93 million people are considered obese.²

Surgery may be the last resort for obese people to achieve a healthy weight and lifestyle. Bariatric surgery promotes weight loss by changing the digestive system's anatomy, which limits the amount of food that can be eaten and digested.³ Bariatric surgery is a viable therapeutic option for obese patients who do not respond to conventional lifestyle interventions for losing weight.⁴ Weight-loss surgeries involve the stomach and digestive tract, and alter certain processes to achieve weight loss. Types of bariatric surgery include gastric bypass, gastric lap band, sleeve gastrectomy, and the duodenal switch.¹

Prior to having surgery, patients must meet certain qualifications. They must be obese, with a BMI over 40, or have a BMI of 35 and have comorbidity such as diabetes, high blood pressure, or sleep apnea, and they must have failed other weight-loss methods. They must attend seminars with a focus on nutrition, psychological awareness, the surgery process, and recovery.⁵

TYPES OF BARIATRIC SURGERY

Gastric bypass surgery—Also called Roux-en-Y gastric bypass, gastric bypass surgery involves making the stomach smaller and rerouting the intestines so that food bypasses most of the stomach and the upper part of the small intestine. It is considered a malabsorptive surgery because it prevents the body from consuming and absorbing many calories and nutrients.¹

Sleeve gastrectomy—Also known as *sleeve*, this is considered a restrictive surgery because the size of the stomach is reduced by 80%. This also helps prevent overeating by removing the area of the stomach that produces the hunger hormone, ghrelin, which is known to affect patients' hunger, satiety, and blood sugar control.¹

Gastric lap band—Often called *the band*, this involves an inflatable band that is placed around the upper portion of the stomach, creating a small stomach pouch

above the band, and the rest of the stomach below the band.¹ The band is adjustable and reversible and, as such, it is considered a restrictive surgery.

Duodenal switch—This is the most complex of bariatric surgeries. It involves the sleeve procedure and then splitting the duodenum and reconnecting that portion to the end of the small intestine.¹ When patients eat, food will not travel through the length of the small intestine where most nutrient and caloric absorption takes place. Thus, the duodenal switch causes weight loss by limiting food intake and preventing caloric absorption.

ORAL CONSIDERATIONS

The time to present a preventive plan is when a patient mentions that he or she will be having weight-loss surgery. It is crucial to formulate a comprehensive, patient-specific plan based on the patient's caries history, periodontal disease status, and oral hygiene regimen. The dental professional should also discuss how important nutrition, dietary supplements, and oral hygiene will become in protecting the patient's dental health and in the person's daily life.

Weight-loss surgery can lead to improved health of the patient, but can also pose some postoperative health risks, including nutritional deficiencies, decreased bone mineral density (BMD), and gastroesophageal reflux disease (GERD) with possible ulceration.⁴ Dental professionals need to be aware of some special considerations so that patients can have optimal oral health after weight-loss surgery. Dental concerns following bariatric surgery include acid reflux and erosion, periodontal disease, xerostomia, caries, and nutritional deficiency contributing to metabolic bone diseases. It is imperative to ask questions and evaluate on a case-by-case basis.

Some patients may not disclose that they have had weight-loss surgery. There is a stigma attached to the surgery, and people may feel vulnerable when they share this information. If a patient has had significant weight loss since his or her last dental visit, it is appropriate to acknowledge this and ask the patient what caused it. Hopefully, an open-ended question will lead the patient to divulge his or her surgery so the dental

professional can prescribe a personalized preventive treatment plan.

ACID REFLUX AND EROSION

Dental professionals know the importance of salivary pH for patients' dental health. The lower the pH of a substance, the higher the acidic content. A pH value of 5.5 or less is considered a dangerous acidic environment for enamel breakdown, and thus dental caries is more likely.

Bariatric surgery can temporarily restrict or permanently alter the digestive tract by removing a portion of the stomach, creating a restrictive pouch for food consumption, or rerouting the intestines, causing portions of the digestive tract to no longer participate in digestion and leading to malabsorption of the nutrients.

Stomach acid and esophageal reflux can become a problem for this population. While most patients are placed on antacids initially, compliance may be an issue long-term. Acid erodes enamel and can cause deterioration of not only teeth, but also of the mucous membranes and esophagus.⁶ While patients who have gastric bypass are less likely to experience acid reflux, they are at an increased risk of vomiting, which also causes enamel erosion.

The types of foods and beverages consumed, and the frequency and time of consumption, are lifestyle factors that are important in the clinical development of dental erosion.⁷ Chewable vitamin supplements often contain citric, malic, phosphoric, tartaric, acetic, or carbonic acid. The presence of any of these acids on the nutrition label indicates that the product is potentially erosive.⁸ Dental professionals can suggest that patients chew their vitamins, and then drink water and swish with water, or chew gum containing xylitol to help eliminate acid on their teeth and rebalance the pH of their saliva.⁹

Fluoride treatments or MI Paste (GC America) combined with optimal home care decreases the likelihood of tooth destruction from acid erosion. Bariatric surgery patients are advised not to have NSAIDs due to their increased risk of stomach ulcers.^{10,11} Pain management medications other than NSAIDs should be considered to prevent further medical complications.

PERIODONTAL DISEASE AND BONE LOSS

Calcium and vitamin D supplements help maintain bariatric patients' periodontal health. If bariatric patients are deficient in calcium or vitamin D, the periodontium may be compromised by weakened bones and eventual osteoporosis.¹²

Osteoporosis is considered a risk factor for periodontal disease since it may influence the alveolar bone loss rate in chronic periodontitis, causing tooth loss.¹² Patients with documented periodontal disease prior to surgery may find their condition has worsened six months postsurgery. Studies by de Carvalho Sales-Peres et al. concluded that "*P. gingivalis* levels increased directly following surgery but decreased at the 12-month mark."¹³ The increase exacerbated already periodontally compromised dentition and caused measurable bleeding, calculus buildup, and increased probing depths in the patients being monitored for the study. Interestingly, the authors mention that while weight loss decreased overall body inflammation, it had no effect on decreasing gingival inflammation.

Vitamin deficiencies also have an effect on periodontal health. Data from the National Health and Nutrition Examination Survey (NHANES) demonstrates that women with a low intake of dietary calcium and low levels of vitamin D due to malabsorption or noncompliance, which can lead to "increased gingival inflammation, tooth loss, and clinical attachment loss."¹² It is imperative that pre- and post-op patients be seen regularly by their dental professionals to monitor and manage any changes to their periodontal health.

CARIES RISK

Postoperative eating guidelines include restricting portion sizes, chewing foods slowly and completely, eating and drinking separately, and avoiding foods that are poorly tolerated.¹⁴ Bariatric patients will no longer be able to gulp large amounts of fluids. This is because of the restrictive nature of bariatric surgery. Patients are likely to have only small sips of liquids multiple times during the day. Patients who have had bariatric surgery run the risk of becoming dehydrated

quickly due to this restriction. They may also frequently sip water with powdered flavorings that contain citric acid, which can be a contributing factor for caries. Patients are advised not to drink with meals and not to consume fluids within 30 minutes before or after eating. This is to allow the stomach to absorb all the nutrition from the food, and so the food will not be pushed through the stomach too quickly. It also prevents overfilling and stretching of the stomach. Sipping artificially sweetened acidic drinks, dehydration, and eating small portions of food multiple times a day can increase the risk of caries in WLS patients.

Xerostomia in combination with high-acid-containing food consumption can promote caries due to lack of saliva buffering. Patients suffering from xerostomia would benefit from saliva substitutes, such as mouth rinses or mints; the use of a water flosser to help eliminate dry, sticky plaque along the gumline and in between teeth; and in-office fluoride varnish treatments to strengthen weakened enamel.

The combination of xerostomia, acid-containing vitamins, frequent consumption of citric acid-containing beverages, and inconsistent oral hygiene creates a high risk for caries. Patients may also report halitosis, which can be attributed to ketosis, a high protein/fat diet, or GERD and gastric acids in the mouth. In fact, frequent or excessive intake of citric acid may cause erosion of

teeth and local irritation of mucous membranes.⁶ Following surgery, patients are often instructed to consume chewy vitamins numerous times over the course of a day as their bodies adjust to tolerate and absorb the nutrients. It would be wise to mention the cariogenicity of the vitamins to patients and encourage them to drink plain water after vitamin consumption to increase pH and decrease caries risk.

NUTRITIONAL DEFICIENCIES

Bariatric surgery can permanently change the way the body absorbs food. According to Majumder et al, "Nutritional deficiencies are an inherent problem in the post-operative period and often require lifelong supplementation."⁷ Patients may be on a nutritionist-guided regimen of vitamins that commonly includes calcium with vitamin D, iron, vitamin B12, and daily multivitamin and mineral tablets.¹⁵ Nutrition has a systemic effect on the integrity of the oral cavity, including teeth, periodontium, oral mucosa, and alveolar bone, making it even more important for dental professionals to ensure that their bariatric patients are eating nutritionally rich diets and taking their prescribed vitamin supplements. Nutritional deficiencies such as iron deficiency anemia and deficiencies of calcium and vitamins B, C, and D may have oral presentations in or around the mouth. Vitamin deficiencies can present in the mucosa and tongue as color

FIGURE 1: VITAMIN REGIMEN

Vitamin/mineral	Symptoms of deficiency
A	Xerophthalmia—red, dry eyes
B12	Pernicious anemia—pale mucous membranes; Glossitis—red, smooth surface of tongue with possible burning sensations; Red lesions in mouth; Angular cheilitis; Candidiasis ¹⁸
C	Scurvy—bleeding gums, gingivitis ¹⁹
D	Rickets—bone softening/loss
Iron	Pica—unusual cravings for nonfood items, such as ice, dirt, paint, or starch; ²⁰ Swollen/sore tongue; Burning sensation in tongue/mouth ^{20,21}
Thiamine	Beriberi—heart and circulation symptoms ¹⁸

changes. According to Via and Mechanick, “Among all patients who undergo bariatric surgery, high rates of micronutrient deficiencies have been observed.”¹⁶ Many factors contribute to nutritional deficiency, “including reduced oral intake of food, decreased GI absorption, food intolerance, nausea/vomiting, and nonadherence with dietary supplements.”¹⁷

Encouraging patient compliance with the vitamin regimen recommended by their bariatric surgeon is important in bridging the oral and systemic health link.

PATIENT COMPLIANCE

Post-weight-loss-surgery patients will likely be given a daily vitamin regimen with sufficient supplements to protect their bodies from nutrient malabsorption and deficiencies (figure 1). However, dental professionals should question their patients’ compliance of this regimen by taking a thorough health history. For example, calcium and vitamin D are crucial for bone support. Patients who have had bariatric surgery are at risk for osteoporosis due to the malabsorption of both nutrients. Osteoporosis weakens bone strength and can result in tooth loss. It is imperative that bariatric patients take daily calcium and vitamin D supplements as a precaution.

DENTAL RECOMMENDATIONS

Recommendations for bariatric patients might include follow-up questions on their health histories to:

- Inquire about which bariatric surgery the patient had
- Identify noticeable dental concerns or changes, such as tooth discoloration or gingival bleeding
- Recommend postsurgery vitamin regimen
- Assess frequency of eating and drinking
- Identify use of water flavoring/additives
- Inquire about incidence of vomiting
- Note any dryness or odor in the mouth

A preventive plan may include fluoride gels, MI Paste, or fluoridated mouth rinse to help remineralize weakened enamel as the result of acids from reflux and vitamins. Products that neutralize acidic pH are beneficial in caries management. An electric toothbrush and appropriate interproximal aids such as a water flosser, string floss, or

interdental brush will help reduce plaque accumulation. Xylitol products may be helpful for dryness and caries prevention. Numerous clinical trials have shown that chewing sugar-free gum protects against dental caries.⁸ Nutritional counseling should be considered when caries is likely or present. A caries management by risk assessment (CAMBRA) should be utilized to further identify high-risk patients.²² Dental professionals should strongly encourage frequent recalls to monitor gingival and dental health. A presurgical dental screening should be considered by the bariatric surgical team for a comprehensive review of the patient’s overall health. This would also allow for baseline dental monitoring, preventive education, and treatment as needed.

Individuals who revert to poor eating habits compromise the success of the weight-loss surgery and may develop health risks such as diabetes and obesity. Tooth loss, bone loss, and burning mouth sensation caused by poor nutrition can also compromise overall health.

As dental professionals, we need to continuously educate ourselves on the connection between the mouth and the rest of the body. If we are not comfortable discussing a condition/surgery, we may be missing information that is vital to our patients’ oral health. It would be a disservice to our patients in this growing WLS population to be undereducated on their dental risks.

SURVEY RESULTS

The author presented two separate anonymous online surveys to groups of bariatric patients as well as dental professionals via SurveyMonkey. In total, 269 dental professionals and 196 bariatric surgery patients completed these surveys. Bariatric surgery patients were questioned on their experiences with dental care, what their surgical teams instructed them to do postoperatively for dental care, and what they experienced following surgery. Of the dental professionals who completed the survey, 97% were registered dental hygienists, with the remaining percentage being a combination of certified dental assistants and expanded function dental auxiliaries. Eighty-eight percent of survey takers selected “Yes”; they had treated a patient who had bariatric surgery. This

is consistent with the statistics showing that more people are having bariatric surgery every year. Three percent of respondents selected “I’m not sure” as their answer, perhaps with the realization that patients may not be forthcoming with their health histories.

Dental professionals were questioned on what they currently know about bariatric patients and any special considerations they take when treating WLS patients:

What oral hygiene instructions do you give your bariatric surgery patients?

- Electric toothbrush: 79%
- String floss: 61%
- Water flosser: 45%
- Fluoride gels, prescription (e.g., Preident; Colgate): 39%
- Prescription mouth rinse (e.g., chlorhexidine): 3%
- MI Paste: 13%
- Biotene (GlaxoSmithKline) or another dry-mouth rinse: 19%
- Proxabrush (Gum/Sunstar): 21%
- Other: 3%

Respondents reported the following conditions as present in bariatric patients postsurgery:

- Acid reflux/erosion: 42%
- Caries: 30%
- Gingivitis: 30%
- Xerostomia: 25%
- Periodontal disease: 20%
- Halitosis: 17%
- None of these conditions: 38%

The most revealing question asked dental professionals about their comfort level in discussing bariatric surgery and dental considerations. It is clear that this topic needs more attention in our profession:

Are you comfortable discussing bariatric surgery and dental considerations with patients?

- Yes, I feel I know a lot about this type of patient: 18%
- Maybe, I know some information but would like to learn more: 38%
- Not really, I don’t know enough: 40%
- No, I would prefer not to talk about this topic with my patients: 2%

The author’s investigation with bariatric

surgery patients showed that bariatric surgical teams recommended different postoperative instructions regarding what to eat, what to drink, and vitamin supplements. There was not consistency among bariatric professionals in their recommendations to patients.

CONCLUSION

When patients have had bariatric surgery, they have made a body-altering decision to prolong their lives by potentially alleviating systemic diseases related to or complicated by obesity. How devastating would it be, then, to unknowingly compromise their dental health and their subsequent nutrition due to lack of a multidisciplinary approach to include knowledge of dental risks and preventive strategies?

Dental professionals need to be aware of the oral-systemic link associated with bariatric surgery. A multidisciplinary approach between dental professionals and primary care physicians, bariatric surgeons, nutritionists, and other specialists will address the oral-systemic link and keep an open conversation. Complete blood panel results ordered by medical doctors that reveal vitamin deficiencies would benefit dental teams in preparing dental preventive care.

If current trends continue, more bariatric patients will be seen each year in the dental chair with caries, bone loss, erosion, and clinical signs of vitamin deficiency. Further longitudinal studies are needed to fully understand the pre- and post-op correlations between bariatric surgery and dental health.

REFERENCES

- American Society for Metabolic and Bariatric Surgery. Estimate of bariatric surgery numbers, 2011-2018. Published June 2018. <https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers>
- Centers for Disease Control and Prevention. Adult obesity facts. Accessed December 3, 2019. <https://www.cdc.gov/obesity/data/adult.html>
- The Free Dictionary. Bariatric surgery. <https://medicaldictionary.thefreedictionary.com/bariatric+surgery>
- Kreykes A, Choxi H, Rothberg A. Post-bariatric surgery patients: your role in their long-term care. *J Fam Pract*. 2017;66(6):356-363. <http://www.mdedge.com/jfponline/article/139105/obesity/post-bariatric-surgery-patients-your-role-their-long-term-care>
- Puhl RM, Himmelstein MS, Quinn DM. Internalizing weight stigma: prevalence and sociodemographic considerations in US adults. *Obes*. 2018;26(1):167-175.
- Bingham E, Cohns B, Powell CH. *Patty's Toxicology, volumes 1-9* (5th ed). John Wiley & Sons. New York, NY. 2001.
- Majumder S, Soriano J, Louie Cruz A, Dasanu CA. Vitamin B12 deficiency in patients undergoing bariatric surgery: preventive strategies and key recommendations. *Surg Obes Relat Dis*. 2013;9(6):1013-9. doi: 10.1016/j.soard.2013.04.017. <https://www.ncbi.nlm.nih.gov/pubmed/24091055>
- Moynihan PJ. Dietary advice in dental practice. *Br Dent J*. 2002;193:563-568. <http://www.nature.com/articles/4801628>
- Touger-Decker R, van Loveren C. Sugars and dental caries. *Am J Clin Nutr*. 2003;78(4):881S-892S. <http://ajcn.nutrition.org/content/78/4/881S.full>
- Scarlata K. The FODMAPs approach—minimize consumption of fermentable carbs to manage functional gut disorder symptoms. *Today's Dietitian*. 2010;12(8):30. <http://www.todaysdietitian.com/newarchives/072710p30.shtml>
- de Sousa Prado Geraldo M, Fonseca FLA, de Fatima Veiga Gouveia MR, Feder D. The use of drugs in patients who have undergone bariatric surgery. *Int J Gen Med*. 2014;7:219-224. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4026560/>
- Uwitonze AM, Murererehe J, Ineza MC, et al. Effects of vitamin D status on oral health. *J Steroid Biochem Mol Biol*. 2018;175:190-195. <https://www.sciencedirect.com/science/article/abs/pii/S0960076017300304?via%3Dihub>
- de Carvalho Sales-Peres SH, de Moura-Grec PG, Yamashita JM, et al. Periodontal status and pathogenic bacteria after gastric bypass: a cohort study. *J Clin Periodontol*. 2015;42(6):530-536(7). doi: 10.1111/jcpe.12410
- Parkes E. Nutritional management of patients after bariatric surgery. *Am J Med Sci*. 2006; 331(4):207-213. [https://www.amjmedsci.com/article/S0002-9629\(15\)32808-1/abstract](https://www.amjmedsci.com/article/S0002-9629(15)32808-1/abstract)
- Rickers L, McSherry C. Bariatric surgery: nutritional considerations for patients. *Nurs Stand*. 2012;26(49):41-48.
- Via MA, Mechanick JL. Nutritional and micronutrient care of bariatric surgery patients: current evidence update. *Curr Obes Rep*. 2017;6(3):286-296. <https://www.ncbi.nlm.nih.gov/pubmed/28718091>
- Stein J, Stier C, Raab H, Weiner R. The nutritional and pharmacological consequences of obesity surgery. *Aliment Pharmacol Ther*. 2014;40(6):582-609.
- Allied Health Sciences Section Ad Hoc Nutrition Committee, Aills L, Blankenship J, et al. ASMBS Allied Health Nutrition Guidelines for the Surgical Weight Loss Patient. *Surg Obes Relat Dis*. 2008;4(5 Suppl):S73-S108.
- Sheetal A, Hiremath VK, Patil AG, et al. Malnutrition and its oral outcome—a review. *J Clin Diagn Res*. 2013;7(1):178-180.
- National Institutes of Health. National Heart, Lung, and Blood Institute. Iron deficiency anemia. <https://www.nhlbi.nih.gov/health-topics/iron-deficiency-anemia>
- Wu YC, Wang YP, Chang JY, et al. Oral manifestations and blood profiles in patients with iron deficiency anemia. *J Formos Med Assoc*. 2014;113(2):83-87.
- University of California San Francisco. Accessed July 1, 2019. CAMBRA. <https://dentistry.ucsf.edu/research/cambra>

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QUESTIONS

1. The following are all examples of dental risk factors for postoperative bariatric surgery patients except:
 - A. Acid erosion
 - B. Osteoporosis
 - C. Aphthous ulcers
 - D. Vitamin deficiencies
2. Bariatric surgery patients must meet certain requirements to qualify for weight-loss surgery. Which of these is not a requirement?
 - A. BMI over 22
 - B. Resting heart rate of 100 bpm or more
 - C. Type 2 diabetes
 - D. Hypertension
3. The duodenal switch bariatric surgery consists of:
 - A. Removing 80% of the stomach
 - B. Rerouting the digestive tract
 - C. Preventing absorption of nutrients
 - D. All of the above
4. The sleeve gastrectomy is a restrictive surgery. The gastric band is an absorptive surgery.
 - A. Both statements are true.
 - B. The first statement is true.
The second statement is false.
 - C. The first statement is false.
The second statement is true.
 - D. Both statements are false.
5. If bariatric patients have not been consistent with their daily vitamin regimen, they may present with which of the following clinical signs of iron deficiency?
 - A. Black hairy tongue
 - B. Enlarged tonsils and adenoids
 - C. Red, swollen tongue
 - D. Blunted interproximal papilla
6. Which of the following is an appropriate nutrition question to ask post-bariatric patients at their dental appointments?
 - A. What's your daily intake of calories?
 - B. Are you exercising regularly?
 - C. Have you been drinking water with additives?
 - D. How much weight have you lost?
7. Vitamin C deficiency can result in all of the following except:
 - A. Scurvy
 - B. Bleeding gingiva
 - C. Beriberi
 - D. Gingivitis
8. Your postbariatric surgery patient presents for a dental hygiene appointment. Upon examination you observe a large, swollen tongue, and the patient reports occasional burning sensations in her mouth. You suspect that your patient:
 - A. Has insufficient oral hygiene
 - B. Is iron deficient
 - C. Is vitamin B12 deficient
 - D. Both B and C
9. A CAMBRA questionnaire should be given to all WLS patients due to higher caries risk from nutritional deficiencies and frequency of eating. Fluoridated mouth rinse, MI paste, and pH neutralizing products should be considered during OHI for WLS patients.
 - A. Both statements are true.
 - B. First statement is true. Second statement is false.
 - C. Both statements are false.
 - D. First statement is false. Second statement is true.
10. Acid erosion can affect the teeth and mucous membranes. Erosion can cause xerostomia.
 - A. First statement is true. Second statement is false.
 - B. Both statements are true.
 - C. First statement is false. Second statement is true.
 - D. Both statements are false.
11. Which factor does not contribute to nutritional deficiency?
 - A. Increased intake of food
 - B. Decreased GI absorption
 - C. Food intolerance
 - D. Noncompliance with dietary supplements
12. Patients who have had gastric bypass are more likely to have acid reflux disease than those who have had the other gastric surgeries. Patients who have had gastric bypass have a decreased risk of vomiting.
 - A. Both statements are true.
 - B. Both statements are false.
 - C. First statement is true.
Second statement is false.
 - D. First statement is false.
Second statement is true.
13. Patients who have had weight-loss surgery are advised not to take NSAIDs. NSAIDs cause an increased likelihood of stomach ulcers.
 - A. Both statements are true.
 - B. Both statements are false.
 - C. The first statement is true.
The second statement is false.
 - D. The first statement is false.
The second statement is true.
14. Pica is a side effect of a thiamine deficiency. It involves unusual cravings for nonfood items such as ice, dirt, paint, or starch.
 - A. Both statements are true.
 - B. Both statements are false.
 - C. First statement is true.
Second statement is false.
 - D. First statement is false.
Second statement is true.
15. A disease associated with vitamin D deficiency is:
 - A. Beriberi
 - B. Rickets
 - C. Scurvy
 - D. Spina bifida

ONLINE COMPLETION

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QUESTIONS

16. Post-WLS patients are at risk for dehydration due to:

- A. Inability to drink large quantities of fluids
- B. Inability to drink beverages with meals
- C. Frequent vomiting
- D. All of the above

17. There are universal protocols that all bariatric surgeons give their patients. All patients receive the same recommendations.

- A. Both statements are true.
- B. First statement is true.
Second statement is false.
- C. Both statements are false.
- D. First statement is false.
Second statement is true.

18. Bariatric patients are advised not to drink with meals and not to consume fluids within 30 minutes before or after eating. This prevents overfilling and stretching of the stomach.

- A. Both statements are true.
- B. First statement is true.
Second statement is false.
- C. Both statements are false.
- D. First statement is false.
Second statement is true.

19. Gastric lap band involves an inflatable band that is placed around the upper portion of the stomach creating a small stomach pouch above the band, and the rest of the stomach below the band. Gastric lap band is a reversible procedure.

- A. Both statements are true.
- B. First statement is true.
Second statement is false.
- C. Both statements are false.
- D. First statement is false.
Second statement is true.

20. Which pH represents an acidic environment in the oral cavity?

- A. 5.5
- B. 6.5
- C. 7.5
- D. 8.5

21. Acid erosion can be caused by:

- A. GERD
- B. Prolonged consumption of acidic beverages
- C. Frequent vomiting
- D. All of the above

22. Data from NHANES demonstrates that women with a low intake of dietary calcium have:

- A. More severe periodontal disease
- B. Low levels of vitamin D due to malabsorption or noncompliance
- C. Increased gingival inflammation, tooth loss, and clinical attachment loss
- D. All of the above

23. Osteoporosis weakens bone strength and can result in tooth loss. A lack of vitamin D and calcium can compromise the periodontium.

- A. Both statements are true.
- B. First statement is true.
Second statement is false.
- C. Both statements are false.
- D. First statement is false.
Second statement is true.

24. Prior to having surgery, patients must meet certain qualifications. They must be obese, with a BMI over 40 or have a BMI of 35 and have comorbidity such as diabetes, high blood pressure, or sleep apnea, and/or have failed other weight-loss methods.

- A. Both statements are true.
- B. First statement is true.
Second statement is false.
- C. Both statements are false.
- D. First statement is false.
Second statement is true.

25. All are examples of malabsorptive WLS except:

- a. Duodenal switch
- b. Gastric bypass
- c. Sleeve gastrectomy
- d. None of the above

26. According to the CDC, bariatric surgery promotes weight loss by changing the digestive system's anatomy and limiting the amount of food that can be eaten and digested. In 2017 alone, more than 220,000 people had WLS.

- A. Both statements are true.
- B. First statement is true. Second statement is false.
- C. Both statements are false.
- D. First statement is false. Second statement is true.

27. Nutrition has a systemic effect on:

- A. Teeth
- B. Periodontium
- C. Oral mucosa and alveolar bone
- D. All of the above

28. Which of the following can cause bone softening and tooth loss?

- A. Osteoporosis
- B. Vitamin D deficiency
- C. Both a and b
- D. Neither a nor b

29. A presurgical dental screening should be considered by the bariatric surgical team for a comprehensive review of the patient's overall health. This would also allow for baseline dental monitoring, preventive education, and treatment as needed.

- A. Both statements are true.
- B. First statement is true. Second statement is false.
- C. Both statements are false.
- D. First statement is false. Second statement is true.

30. There are numerous longitudinal studies completed on WLS patients and their dental risks. According to the informal survey shared in this paper, dental professionals feel comfortable discussing dental considerations of WLS patients clinically.

- A. Both statements are true.
- B. First statement is true. Second statement is false.
- C. Both statements are false.
- D. First statement is false. Second statement is true.

Bariatric surgery patients: Dental considerations

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EDUCATIONAL OBJECTIVES

1. Define bariatric surgery
2. Describe the different bariatric surgeries
3. Articulate dental considerations with weight-loss-surgery patients
4. Assess pre- and postoperative dental risk factors
5. Identify clinical signs of vitamin deficiency
6. Gain confidence in speaking to patients about bariatric surgery and dental considerations

COURSE EVALUATION

1. Were the individual course objectives met?

Objective #1: Yes No Objective #2: Yes No

Objective #3: Yes No Objective #4: Yes No

Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.

2. To what extent were the course objectives accomplished overall? 5 4 3 2 1 0

3. Please rate your personal mastery of the course objectives. 5 4 3 2 1 0

4. How would you rate the objectives and educational methods? 5 4 3 2 1 0

5. How do you rate the author's grasp of the topic? 5 4 3 2 1 0

6. Please rate the instructor's effectiveness. 5 4 3 2 1 0

7. Was the overall administration of the course effective? 5 4 3 2 1 0

8. Please rate the usefulness and clinical applicability of this course. 5 4 3 2 1 0

9. Please rate the usefulness of the supplemental bibliography. 5 4 3 2 1 0

10. Do you feel that the references were adequate? Yes No

11. Would you participate in a similar program on a different topic? Yes No

12. If any of the continuing education questions were unclear or ambiguous, please list them.

13. Was there any subject matter you found confusing? Please describe.

14. How long did it take you to complete this course?

15. What additional continuing dental education topics would you like to see?

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