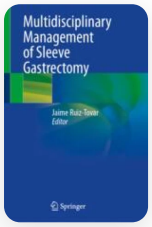
SPRINGER NATURE Link

Log in

Nutritional Optimization

| Chapter | First Online: 02 July 2026

| pp 27–38 | Cite this chapter



Multidisciplinary Management of Sleeve Gastrectomy

Marta González-Ramos

35 Accesses

Abstract

Obesity is a primary global health concern associated with significant morbidity, including metabolic diseases, impaired mobility, sleep disturbances, and increased risk of micronutrient deficiencies. Bariatric surgery has emerged as an effective treatment for severe obesity, offering substantial and sustained weight loss; however, its success depends heavily on comprehensive preoperative nutritional optimization. Evidence shows that many candidates present with deficiencies in vitamin D, B12, B1, folate, iron, zinc, selenium, and protein even before surgery, due to poor dietary quality, chronic inflammation, and altered metabolism. Preoperative nutritional evaluation, utilizing clinical screening tools, biochemical assessments, and individualized dietary counseling, is crucial for minimizing surgical risks, expediting recovery, and preventing postoperative complications. Low-calorie, very low-calorie, and ketogenic diets are commonly used to reduce liver volume, improve metabolic parameters, and facilitate surgical procedures. At the same time, micronutrient supplementation is necessary to correct existing deficits. Emerging strategies, such as immunonutrition, incorporating arginine, omega-3 fatty acids, glutamine, and nucleotides, have shown promising results

in reducing inflammation, improving immune response, and enhancing postoperative outcomes. Overall, integrating dietary interventions, targeted supplementation, and multidisciplinary care into the preoperative period is crucial for optimizing patient health, improving surgical safety, and ensuring long-term bariatric success.

This is a preview of subscription content, log in via an institution to check access.

Access this chapter

Log in via an institution

Subscribe and save

Springer+ from €37.37 /Month

Starting from 10 chapters or articles per month

Access and download chapters and articles from more than 300k books and 2,500 journals

Cancel anytime

View plans

Buy Now

Chapter EUR 29.95

Price includes VAT (Spain)

Available as PDF

Read on any device

Instant download

Own it forever

Buy Chapter

eBook EUR 106.99

Hardcover Book EUR 135.19

Tax calculation will be finalised at checkout

Purchases are for personal use only

Institutional subscriptions →

Explore related subjects

Discover the latest articles, books and news in related subjects, suggested using machine learning.

Nutrition Therapy Weight Management Sports Nutrition Nutrition

Nutritional Supplements Bariatric Surgery

References

1. Obesity and overweight [Internet]. [cited 2025 Nov 22]. Available from: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight

2. Simancas-Racines D, Frias-Toral E, Campuzano-Donoso M, Ramos-Sarmiento D, Zambrano-Villacres R, Reytor-González C, et al. Preoperative nutrition in bariatric surgery: a narrative review on enhancing surgical success and patient outcomes. Nutrients. 2025;17(3):566.

3. Al-Sabah S, Aminian A, Angrisani L, Al Haddad E, Kow L, eds. Laparoscopic sleeve gastrectomy [internet]. Cham: Springer; 2021. [cited 2025 Nov 21]. Available from: https://link.springer.com/10.1007/978-3-030-57373-7

4. Budny A, Janczy A, Mika A. New approaches to the treatment of severe obesity—Prehabilitation as the key to success. Curr Nutr Rep. 2025;14(1):64.

5. Agarwal N, Sharma K. Optimizing micro and macro nutrients. Endocrinol Metab Clin N Am. 2025;54(1):135–47.

6. Deledda A, Pintus S, Loviselli A, Fosci M, Fantola G, Velluzzi F. Nutritional management in bariatric surgery patients. Int J Environ Res Public Health. 2021;18(22):12049.

7. Vieira De Sousa JP, Santos-Sousa H, Vieira S, Nunes R, Nogueiro J, Pereira A, et al. Assessing nutritional deficiencies in bariatric surgery patients: a comparative study of roux-en-Y gastric bypass versus sleeve gastrectomy. J Pers Med. 2024;14(6):650.

8. Dagan SS, Zelber-Sagi S, Webb M, Keidar A, Raziel A, Sakran N, et al. Nutritional status prior to laparoscopic sleeve gastrectomy surgery. Obes Surg. 2016;26(9):2119–26.

9. Van Rutte PWJ, Aarts EO, Smulders JF, Nienhuijs SW. Nutrient deficiencies before and after sleeve gastrectomy. Obes Surg. 2014;24(10):1639–46.

10. Ben-Porat T, Elazary R, Yuval JB, Wieder A, Khalaileh A, Weiss R. Nutritional deficiencies after sleeve gastrectomy: can they be predicted preoperatively? Surg Obes Relat Dis Off J Am Soc Bariatr Surg. 2015;11(5):1029–36.

11. Reytor-González C, Frias-Toral E, Nuñez-Vásquez C, Parise-Vasco JM, Zambrano-Villacres R, Simancas-Racines D, et al. Preventing and managing pre- and

postoperative micronutrient deficiencies: a vital component of long-term success in bariatric surgery. Nutrients. 2025;17(5):741.

12. Steenackers N, De Boer L, Dekempeneer C, Deleus E, Lannoo M, Mertens A, et al. Current clinical practice guidelines for nutritional screening before and after sleeve gastrectomy and roux-En-Y gastric bypass: a scoping review. Curr Obes Rep. 2025;14(1):16.

13. Frias-Toral E, Chapela S, Gonzalez V, Martinuzzi A, Locatelli J, Llobera N, et al. Optimizing nutritional management before and after bariatric surgery: a comprehensive guide for sustained weight loss and metabolic health. Nutrients. 2025;17(4):688.

14. Barrea L, Verde L, Schiavo L, Sarno G, Camajani E, Iannelli A, et al. Very low-calorie ketogenic diet (VLCKD) as pre-operative first-line dietary therapy in patients with obesity who are candidates for bariatric surgery. Nutrients. 2023;15(8):1907.

15. Nilsen I, Andersson A, Laurenius A, Österberg J. Low-energy diets before metabolic bariatric surgery: a systematic review of the effect on total body weight, liver volume, glycemia and side effects. Obes Rev. 2025;26(4):e13876.

16. Bettini S, Belligoli A, Fabris R, Busetto L. Diet approach before and after bariatric surgery. Rev Endocr Metab Disord. 2020;21(3):297–306.

17. Holderbaum M, Casagrande DS, Sussenbach S, Buss C. Effects of very low calorie diets on liver size and weight loss in the preoperative period of bariatric surgery: a systematic review. Surg Obes Relat Dis. 2018;14(2):237–44.

18. Xu Y, Yang S, Luo R, Wu L, Lin Y, Xi Y, et al. Optimizing bariatric surgery outcomes: the dual benefits of preoperative very-low-calorie diets. Obes Surg. 2025;35(8):3057–63.

19. Yolsuriyanwong K, Thanavachirasin K, Sasso K, Zuro L, Bartfield J, Marcotte E, et al. Effectiveness, compliance, and acceptability of preoperative weight loss with a liquid very low-calorie diet before bariatric surgery in real practice. Obes Surg. 2019;29(1):54–60.

20. Khalooeifard R, Rahmani J, Ghoreishy SM, Tavakoli A, Najjari K, Talebpour M. Evaluate the effects of different types of preoperative restricted calorie diets on weight, body mass index, operation time and hospital stay in patients undergoing bariatric surgery: a systematic review and meta analysis study. Obes Surg. 2024;34(1):236–49.

21. Lange UG, Moulla Y, Schütz T, Blüher M, Peter V, Shang E, et al. Effectiveness and tolerability of a two-week hypocaloric protein-rich diet prior to obesity surgery with two different diet interventions: a prospective randomized trial. Obes Surg. 2022;32(9):2903–13.

22. Argyrakopoulou G, Konstantinidou SK, Dalamaga M, Kokkinos A. Nutritional deficiencies before and after bariatric surgery: prevention and treatment. Curr Nutr Rep. 2022;11(2):95–101.

23. Gasmi A, Bjørklund G, Mujawdiya PK, Semenova Y, Dosa A, Piscopo S, et al. Dietary supplements and bariatric surgery. Crit Rev Food Sci Nutr. 2023;63(25):7477–88.

24. Sander J, Torensma B, Siepe J, Schorp T, Schulte T, Schmeer C, et al. Assessment of preoperative multivitamin use on the impact on micronutrient deficiencies in patients with obesity prior to metabolic bariatric surgery. Obes Surg. 2025;35(5):1818–26.

25. Tang X, Reidlinger DP, Crichton M, Craggs-Dino L, Fayet-Moore F, Marshall S. Preoperative micronutrient repletion strategies in metabolic and bariatric surgery: a systematic review. J Acad Nutr Diet. 2025;125(6):761–784.e6.

26. Calder PC. Immunonutrition in surgical and critically ill patients. Br J Nutr. 2007;98(S1):S133–9.

27. Goyal A, Macias CA, Corzo MP, Vargas VPS, Mendoza M, Guarecuco Castillo JE, et al. Perioperative immunonutrition in gastrointestinal oncology: a comprehensive umbrella review and meta-analysis on behalf of TROGSS—the robotic global surgical society. Nutrients. 2025;17(14):2304.

28. García-Malpartida K, Aragón-Valera C, Botella-Romero F, Ocón-Bretón MJ, López-Gómez JJ. Effects of Immunonutrition on cancer patients undergoing surgery: a scoping review. Nutrients. 2023;15(7):1776.

29. Ham HJ, Kim J. Targeted nutritional strategies in postoperative care. Anesth Pain Med. 2025;20(1):34–45.

30. Shanmugasundaram Prema S, Ganapathy D, Shanmugamprema D. Prehabilitation strategies: enhancing surgical resilience with a focus on nutritional optimization and multimodal interventions. Adv Nutr. 2025;16(4):100392.

31. Buzquurz F, Bojesen RD, Grube C, Madsen MT, Gögenur I. Impact of oral preoperative and perioperative immunonutrition on postoperative infection and mortality in patients undergoing cancer surgery: systematic review and meta-analysis with trial sequential analysis. BJS Open. 2020;4(5):764–75.

32. Marik PE, Zaloga GP. Immunonutrition in high-risk surgical patients: a systematic review and analysis of the literature. J Parenter Enter Nutr. 2010;34(4):378–86.

33. D'Ignazio A, Kabata P, Ambrosio MR, Polom K, Marano L, Spagnoli L, et al. Preoperative oral immunonutrition in gastrointestinal surgical patients: how the tumour microenvironment can be modified. Clin Nutr ESPEN. 2020;38:153–9.

34. Rivera-Carranza T, Azaola-Espinosa A, Bojalil-Parra R, Zúñiga-León E, León-Téllez-Girón A, Rojano-Rodríguez ME, et al. Immunometabolic changes following gastric bypass and sleeve gastrectomy: a comparative study. Obes Surg. 2025;35(2):481–95.

35. Lazaro A, Tiago I, Mendes J, Ribeiro J, Bernardes A, Oliveira F, et al. Sleeve gastrectomy and gastric bypass impact in patient's metabolic, gut microbiome, and Immuno-inflammatory profiles—a comparative study. Obes Surg. 2025;35(3):733–45.

36. Jump DB, Lytle KA, Depner CM, Tripathy S. Omega-3 polyunsaturated fatty acids as a treatment strategy for nonalcoholic fatty liver disease. Pharmacol Ther. 2018;181:108–25.

37. Tabesh MR, Eghtesadi M, Abolhasani M, Maleklou F, Ejtehadi F, Alizadeh Z. Nutrition, physical activity, and prescription of supplements in pre- and post-bariatric surgery patients: an updated comprehensive practical guideline. Obes Surg. 2023;33(8):2557–72.

38. Iannelli A, Martini F, Schneck AS, Ghavami B, Baudin G, Anty R, et al. Preoperative 4-week supplementation with omega-3 polyunsaturated fatty acids reduces liver volume and facilitates bariatric surgery in morbidly obese patients. Obes Surg. 2013;23(11):1761–5.

39. Lewis MC, Phillips ML, Slavotinek JP, Kow L, Thompson CH, Toouli J. Change in liver size and fat content after treatment with Optifast very low calorie diet. Obes Surg. 2006;16(6):697–701.

40. Bakker N, van den Helder RS, Geenen RWF, Hunfeld MA, Cense HA, Demirkiran A, et al. Four weeks of preoperative Omega-3 fatty acids reduce liver volume: a randomised controlled trial. Obes Surg. 2019;29(7):2037–44.

41. Ruiz-Tovar J, Blanca M, Garcia A, Gonzalez J, Gutierrez S, Paniagua A, et al. Preoperative administration of Omega-3 fatty acids on postoperative pain and acute-phase reactants in patients undergoing roux-en-Y gastric bypass: a randomized clinical trial. Clin Nutr. 2019;38(4):1588–93.

42. OBELCHE Group, Ruiz-Tovar J, Zubiaga L, Diez M, Murcia A, Boix E, et al. Preoperative regular diet of 900 kcal/day vs balanced energy high-protein formula vs Immunonutrition formula: effect on preoperative weight loss and postoperative pain, complications and analytical acute phase reactants after laparoscopic sleeve gastrectomy. Obes Surg. 2016;26(6):1221–7.

Author information

Authors and Affiliations

Health Sciences Department, San Juan de Dios School of Nursing and Physical Therapy, Comillas Pontifical University, Madrid, Spain
Marta González-Ramos

Corresponding author

Correspondence to Marta González-Ramos.

Editor information

Editors and Affiliations

Department of Biomedicine and Health Sciences, Alfonso X University, Madrid, Spain
Jaime Ruiz-Tovar

Rights and permissions

Reprints and permissions

Copyright information

© 2026 The Author(s), under exclusive license to Springer Nature Switzerland AG

About this chapter

Cite this chapter

González-Ramos, M. (2026). Nutritional Optimization. In: Ruiz-Tovar, J. (eds) Multidisciplinary Management of Sleeve Gastrectomy. Springer, Cham. https://doi.org/10.1007/978-3-032-25644-7_3

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-032-25644-7_3	02 July 2026	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-032-25643-0	978-3-032-25644-7	Medicine Medicine (R0)

Keywords

Nutritional optimization Preoperative diet Micronutrient deficiencies Immunonutrition

Publish with us

Policies and ethics