Obstructive Sleep Apnea Care Essentials

A Pocket Guide for Clinicians

This resource was commissioned by Lilly Medical and is indicated to be used by HCPs for medical, educational, and scientific purposes.

Lilly A MEDICINE COMPANY

OSA Management in the Primary Care Setting

Welcome! As a frontline provider in patient care, you play a crucial role in the early identification, management, and ongoing support of individuals affected by obstructive sleep apnea (OSA). Understanding what to look for and how to guide patients through diagnosis and treatment can make a difference in whether patients receive care. This brochure covers:

- How to recognize and screen for OSA
- OSA diagnosis
- Treatment options for OSA

Included in the pages of this brochure are links to additional resources for further information as needed.

Table of Contents

OSA Overview

OSA is the most common sleep disorder in adults evaluated at sleep centers.[1]

It is caused by repetitive collapse of the upper airway during sleep.[1]

Episodes of airflow obstruction cause arousal from sleep and oxyhemoglobin desaturation.[1]

Approximately 1 in 7 (or 24 million) individuals in the US have moderate to severe OSA.[2]

~70%
of people with OSA have obesity[3]

80%-90%
of patients with OSA are undiagnosed[4]

Lilly

Scan the QR code to learn more

OSA Symptoms

Patients can have common and/or uncommon symptoms

Common Symptoms

Snoring[5,6]

Breathing pauses, choking, or gasping during sleep[5,6]

Unrefreshing sleep[5,a]

Daytime sleepiness[5-8,a,b]

Morning headache[5,8]

Large neck circumference[6]

Men are more likely to present with hallmark OSA symptoms.[9,10]

[a]The relationship between OSA severity and accompanying symptoms (eg, daytime sleepiness, unrefreshing sleep, depression) is not well established.[7] [b]Daytime symptoms (eg, sleepiness) and apnea-hypopnea index (AHI) measurements of the severity of OSA are not strongly correlated.[7]

Lilly

Scan the QR code to learn more

OSA Symptoms (cont.)

Patients can have common and/or uncommon symptoms

Uncommon Symptoms

Insomnia[8,9]

Brain fog and difficulty concentrating[7]

Decreased libido[7]

Depression and irritability[7,9,a]

Fatigue[6-9]

Women may present with vague OSA symptoms, which can make diagnosis more challenging and reduce their likelihood of undergoing screening.[9]

[a]The relationship between OSA severity and accompanying symptoms (eg, daytime sleepiness, unrefreshing sleep, depression) is not well established.[7]

Lilly

Scan the QR code to learn more

OSA Comorbidities

A large percentage of patients with cardiometabolic disease also have OSA

Obesity[11]

55%-90%

Type 2 diabetes[5]

65%-85%

Hypertension[5]

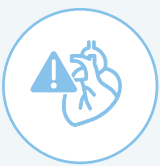
73%-82%

Stroke[5]

71%

Atrial fibrillation[5]

76%-85%



Heart failure[11,12]

12%-64%

Consider screening for OSA in patients with these diseases.

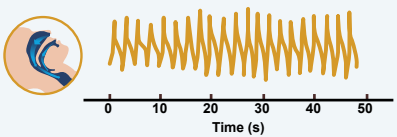
Lilly

Scan the QR code to learn more

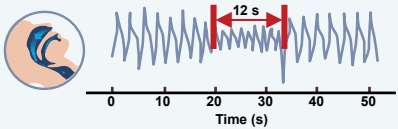
Understanding the Apnea-Hypopnea Index (AHI)

OSA severity is quantified by AHI[6]

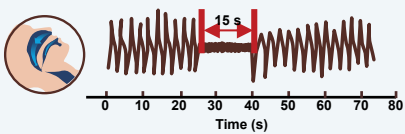
Normal Breathing



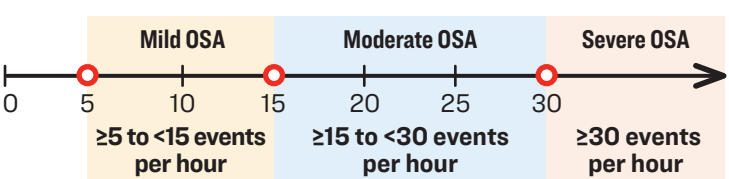
Sleep Hypopnea Event



Sleep Apnea Event



AHI: number of apnea and hypopnea events that occur per hour



Lilly

Scan the QR code to learn more

OSA Screening and Diagnosis Algorithm

The American Academy of Sleep Medicine offers an algorithm for OSA screening and diagnosis.[13]

Step 1: Screen the patient for OSA risk.

Includes physical examination (eg, weight, BMI, tongue size, neck circumference), sleep questionnaires, and sleep-related history. Although information from wearable devices can assist in OSA screening, it should be used to complement the tools described above rather than replace them.[13-15]

Step 2: Take ≥1 of the following actions based on patient characteristics: identify the appropriate sleep test, provide supportive/lifestyle care (eg, weight management counseling), or refer to a sleep or obesity specialist.[6]

PSG and HSATs are accepted tests to diagnose OSA per the current AASM Clinical Practice Guidelines.[13]

AASM = American Academy of Sleep Medicine; BMI = body mass index; HSAT = home sleep apnea test; PSG = polysomnography.

Lilly

Scan the QR code to learn more

OSA Screening and Diagnosis Algorithm (cont.)

Positive diagnosis from step 2?

Step 3a: Discuss treatment options and coordinate appropriate referrals.[13]

Negative diagnosis from step 2?

Step 3b: Evaluate for other sleep disorders or perform PSG. Repeat step as needed.[13]

Step 4: Initiate OSA treatment (CPAP therapy, pharmacotherapy for weight loss, surgery, or oral appliances).[6]

Step 5: Follow up, coordinating as needed with specialists.[13]

CPAP = continuous positive airway pressure.

Lilly

Scan the QR code to learn more

Screening Questionnaires for OSA

Short, easy-to-fill-out surveys

STOP-Bang Questionnaire: most commonly used survey; 8 questions (4 related to OSA clinical features, 4 related to demographics); high sensitivity[16,17]

STOP-Bang score	0-2	3-4	5-8
Risk of moderate-to-severe OSA	Low	Intermediate	High

Additional questionnaires

Epworth Sleepiness Scale – daytime sleepiness (10 questions)[18]

Berlin Questionnaire – snoring, daytime sleepiness, and obesity/blood pressure (10 questions)[19]

Pittsburgh Sleep Quality Index – sleep quality (19 items)[20]

Functional Outcomes of Sleep Questionnaire – quality of life as related to disorders of excessive sleepiness (30 questions)[21]

Surveys or portions of surveys can be included on patient intake forms to assist in screening.

Selecting the Appropriate Test in Primary Care

The PCP is in the best position to screen and help diagnose patients with OSA.[22]

Clinical suspicion of OSA?

YES

Moderate or high pretest probability of OSA based on clinical presentation?[13]

YES

NO

Significant cardiopulmonary conditions, neuromuscular disease resulting in respiratory weakness, chronic opioid use, history of stroke, or symptoms of significant nonrespiratory sleep disorders?[2]

NO

YES

Home sleep apnea test[5,22-24]

PSG[5,22-25]

Positive diagnosis and technically adequate results?[13]

NO

Evaluate for other sleep disorders or perform PSG if OSA not ruled out[13]

YES

Identify appropriate OSA treatment option for patient[13]

PCP = primary care provider.

Lilly

Scan the QR code to learn more

Home Sleep Apnea Tests

Conducted at home rather than in a hospital setting[22]

Appropriate for patients at high risk for OSA without cardiac, pulmonary, or neurologic comorbidities.[5,13]

Collected data are used to calculate the rate of apneas and hypopneas.[5]

HSAT types[23]

Type 2: measures EEG, EOG, chin EMG, ECG, airflow, respiratory effort, and O_2 saturation

Type 3 (most common): measures 4-6 signals (2 respiratory variables, O_2 saturation, and heart rate)

Type 4: measures airflow and O_2 saturation

PCPs can order an HSAT without referring the patient to a sleep specialist.[22]

ECG = electrocardiogram; EEG = electroencephalogram; EMG = electromyography; EOG = electrooculography.

Lilly

Scan the QR code to learn more

Polysomnography

Conducted in a sleep lab[13]

Recommended for patients with conditions that place them at an increased risk of nonobstructive sleep-disordered breathing or chronic opioid medication use.[13]

Measures EEG, EOG, chin EMG, ECG, airflow, respiratory effort, and O_2 saturation.[5]

PSG options[22]

Full: tracks parameters for entire night, followed by a second night of titration

Split-night: half-night parameter tracking followed by PAP titration on the same night

> PSG usually requires referring the patient to a sleep specialist.[22]

PAP = positive airway pressure.

Lilly

Scan the QR code to learn more

Codes for OSA and Common Comorbidities

Code	Description
G47.33	OSA[26]
E66.01	Obesity (BMI ≥30)[27]
E66.1	Drug-induced obesity[27]
I10	Essential (primary) hypertension[28]
I48.91	Unspecified atrial fibrillation[29]
E11.65	T2D with hyperglycemia[29]

Confirm the exact type of sleep apnea from the sleep study and use code G47.33 for OSA[30]

Make sure your ICD-10 code always appears on your treatment claims and that it aligns with the documented condition[30]

Document comorbidities and include codes for complications as appropriate. For obesity diagnoses, include a Z code for BMI (Z68.XX)[27]

Lilly

Scan the QR code to learn more

Current Procedural Terminology Codes (CPT) for OSA[31]

CPT Code	Description
95782	PSG; <6 years of age, sleep staging with ≥4 additional sleep parameters, attended by a technologist
95783	PSG; <6 years of age, sleep staging with ≥4 additional sleep parameters, with initiation of CPAP therapy or bilevel ventilation, attended by a technologist
95800	Sleep study, unattended, simultaneous recording; heart rate, O_2 saturation, respiratory analysis, and sleep time
95801	Sleep study, unattended, simultaneous recording; minimum of heart rate, O_2 saturation, and respiratory analysis
95806	Sleep study, unattended, simultaneous recording of heart rate, O_2 saturation, respiratory airflow, and respiratory effort

CPT Codes for OSA (cont.)[31]

CPT Code	Description
95807	Sleep study, simultaneous recording of ventilation, respiratory effort, ECG or heart rate, and O_2 saturation, attended by a technologist
95808	PSG; any age, sleep staging with 1-3 additional sleep parameters, attended by a technologist
95810	PSG; ≥6 years of age, sleep staging with ≥4 additional sleep parameters, attended by a technologist
95811	PSG; ≥6 years of age, sleep staging with ≥4 additional sleep parameters, initiation of CPAP therapy or bilevel ventilation, attended by a technologist
94660	CPAP ventilation initiation and management

Treatment Options for OSA Overview[5]

CPAP

Hypoglossal nerve stimulation

Mandibular advancement devices

Surgical procedures

Weight management

Continuous Positive Airway Pressure

Overview – Pressure is delivered to the airway through a mask worn over the nose or nose and mouth to prevent airway collapse during inspiration[5]

Characteristics of typical patient using this treatment option – moderate-to-severe OSA[32]

Efficacy – reduction in AHI of 33.3%-48.3% when compliance (ie, used for ≥4 hours per night) is followed[33]

Compliance – 17%-54%[34]

Hypoglossal Nerve Stimulation

Overview – Surgically implanted electrode stimulates the hypoglossal nerve to enhance tongue protrusion and stabilize the upper airway during inspiration[5]

Characteristics of typical patient using this treatment option – patients with moderate-to-severe OSA intolerant to CPAP, without severe obesity, and with <25% central mixed events[35]

Efficacy – 50% reduction in AHI[36]

Compliance – 52.5%-94%[37-39]

Mandibular Advancement Devices

Overview – Specialized dental trays are fitted to the upper and lower teeth. Position of the plates is adjusted, allowing advancement of the mandible relative to the maxilla, thereby increasing upper airway volume[5]

Characteristics of typical patient using this treatment option – mild-to-moderate OSA, tongue-base collapse at DISE, intolerant of PAP[32]

Efficacy – 23.9%-72.0% reduction in AHI[40]

Compliance – 83% (ie, used for ≥4 hours per night)[41]

DISE = drug-induced sleep endoscopy procedure.

Surgery: Maxillomandibular Advancement

Overview – Le Fort I maxillary and bilateral mandibular osteotomies are used to produce forward fixation of the facial skeleton by approximately 10 mm[5]

Characteristics of typical patient using this treatment option – severe OSA (AHI >30), unsuccessful previous surgeries for OSA, poor tolerance of CPAP. Outcomes are less favorable in patients with cardiovascular disease[42-44]

Efficacy – mean postoperative reduction in AHI of 47.8 (80.1% reduction), successful surgery rate of 85.5%, surgical cure rate of 38.5%[42,a]

Compliance – Successful surgery ensures compliance[42]

[a]Surgical success is defined as a reduction in AHI >50% + postoperative AHI <20. Surgical cure defined as postoperative AHI <5.

Lilly

Surgery: Soft Tissue Procedures

Overview – Includes uvulopalatopharyngoplasty (UPPP), barbed reposition pharyngoplasty (BRP), expansion sphincter pharyngoplasty (ESP), lateral expansion pharyngoplasty (LEP), and related procedures. Portions of soft tissue upper airways are repositioned or removed to increase pharyngeal volume[45-48]

Characteristics of typical patient using this treatment option – intolerant of or noncompliant with CPAP or has anatomical abnormalities like enlarged oral soft tissues[45-49]

Efficacy – 49.8%-67.0% reduction in AHI[46]

Compliance – Successful surgery ensures compliance; increases in BMI after surgery can reduce efficacy[49]

Weight Management

Overview – Reduction in weight reduces fat deposition around the neck and upper airways, thereby increasing upper airway volume. Weight loss treatments include lifestyle changes, obesity management medications (OMMs), and bariatric surgery[5,50]

Indication – all overweight/obese patients with OSA; bariatric surgery in severely obese patients[50]

Efficacy – BMI reduction of 20% associated with an AHI reduction of 57%[51]

Compliance – 60.5% for lifestyle changes,[52] 18.1%-41.8% for OMMs[53]; successful bariatric surgery guarantees compliance, although adherence to 1-year follow-up appointments ranges from 54.3%-75.0%[54,55]

References

1. Chang JL, Goldberg AN, Alt JA, et al. International consensus statement on obstructive sleep apnea. *Int Forum Allergy Rhinol*. 2023;13(7):1061-1482.
2. Benjafield AV, Ayas NT, Eastwood PR, et al. Estimation of the global prevalence and burden of obstructive sleep apnoea: a literature-based analysis. *Lancet Respir Med*. 2019;7(8):687-698.
3. Wolk R, Shamsuzzaman ASM, Somers VK. Obesity, sleep apnea, and hypertension. *Hypertension*. 2003;42(6):1067-1074.
4. Finkel KJ, Searleman AC, Tymkew H, et al. Prevalence of undiagnosed obstructive sleep apnea among adult surgical patients in an academic medical center. *Sleep Med*. 2009;10(7):753-758.
5. Gottlieb DJ, Punjabi NM. Diagnosis and management of obstructive sleep apnea: a review. *JAMA*. 2020;323(14):1389-1400.
6. Yeghiazarians Y, Jneid H, Tietjens JR, et al. Obstructive sleep apnea and cardiovascular disease: a scientific statement from the American Heart Association. *Circulation*. 2021;144(3):e56-e67.
7. Macey PM, Woo MA, Kumar R, et al. Relationship between obstructive sleep apnea severity and sleep, depression and anxiety symptoms in newly-diagnosed patients. *PLOS One*. 2010;5(4):e10211.
8. Meyer EJ, Wittert GA. Approach the patient with obstructive sleep apnea and obesity. *J Clin Endocrinol Metab*. 2024; 109(3):e1267-e1279.
9. Bouloukaki I, Tsiligianni I, Schiza S, et al. Evaluation of obstructive sleep apnea in female patients in primary care: time for improvement? *Med Princ Pract*. 2021;30(6):508-514.
10. Nigro CA, Dibur E, Borsini E, et al. The influence of gender on symptoms associated with obstructive sleep apnea. *Sleep Breath*. 2018;22:683-693.
11. Antonaglia C, Passuti G. Obstructive sleep apnea syndrome on non-obese patients. *Sleep Breath*. 2022;26(2):513-518.
12. Khattak HK, Hayat F, Pamboukian SV, Hahn HS, Schwartz BP, Stein PK. Obstructive sleep apnea in heart failure: review of prevalence, treatment with continuous positive airway pressure, and prognosis. *Tex Heart Inst J*. 2018;45(3):151-161.

13. Kapur VK, Auckley DH, Chowdhuri S, et al. Clinical practice guideline for diagnostic testing for adult obstructive sleep apnea: an American Academy of Sleep Medicine clinical practice guideline. *J Clin Sleep Med*. 2017;13(3):479-504.
14. Abd-Alrazaq A, Aslam H, AlSaad R, et al. Detection of sleep apnea using wearable AI: systematic review and meta-analysis. *J Med Internet Res*. 2024;26:e58187.
15. Hayano J, Adachi M, Sasaki F, Yuda E. Quantitative detection of sleep apnea in adults using inertial measurement unit embedded in wristwatch wearable devices. *Sci Rep*. 2024;14(1):4050.
16. Chung F, Subramanyam R, Liao P, Sasaki E, Shapiro C, Sun Y. High STOP-Bang score indicates a high probability of obstructive sleep apnoea. *Br J Anaesth*. 2012;108(5):768-775.
17. Chung F, Abdullah HR, Liao P. STOP-Bang Questionnaire a practical approach to screen for obstructive sleep apnea. *Chest*. 2016;149(3):631-638.
18. Johns MW. A new method for measuring daytime sleepiness: the Epworth Sleepiness Scale. *Sleep*. 1991;14(6):540-545.
19. Shahid A, Wilkinson K, Marcu S, Shapiro CM. Berlin Questionnaire. In: Shahid A, Wilkinson K, Marcu S, Shapiro C, eds. *STOP, THAT and One Hundred Other Sleep Scales*. Springer; 2011:71-73.
20. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res*. 1989;28(2):193-213.
21. Chasens ER, Ratcliffe SJ, Weaver TE. Development of the FOSQ-10: a short version of the Functional Outcomes of Sleep Questionnaire. *Sleep*. 2009;32(7):915-919.
22. Barnes N, Herbert L. Managing obstructive sleep apnea with positive airway pressure therapy in primary care. *J Nurse Pract*. 2023;19(7):104649.
23. Hussein O, Alkhader A, Gohar A, Bhat A. Home sleep apnea testing for obstructive sleep apnea. *Mo Med*. 2024;121(1):60-65.
24. Yamada Y, Kasagi S, Tamura H, et al. Clinical utility of a type 4 portable device for in-home screening of sleep disordered breathing. *Ann Palliat Med*. 2020;9(5)2895-2902.

25. Chesson AL, Ferber RA, Fry JM, et al. Practice parameters for the indications for polysomnography and related procedures. *Sleep*. 1997;20(6):406-422.
26. iCRM. ICD-10 Code G47.33 – A Closer Look at Obstructive Sleep Apnea. Accessed September 9, 2025. https://ircm.com/blog/obstructive-sleep-apnea-icd10-code/
27. American Academy of Professional Coders. ICD-10 Codes for Obesity Management Tip Sheet. Accessed November 24, 2025. https://www.aapa.org/wp-content/uploads/2018/09/FINAL_Obesity_ICD10_Codes.pdf
28. CMS.gov ICD-10-CM/PCS MS-DRG v41.0 Definitions Manual. Accessed October 29, 2025. https://www.cms.gov/icd10m/FY2024-version41-fullcode-cms/fullcode_cms/P0150.html
29. ICD10Data.com. Accessed October 29, 2025. https://www.icd10data.com/ICD10CM/Codes/
30. Cadence Collaborative. Accessed September 30, 2025. https://cadencecollaborative.com/blog/icd-10-coding-cpap-sleep-apnea/
31. American Academy of Sleep Medicine. Sleep Medicine Codes. Accessed February 17, 2026. https://aasm.org/clinical-resources/coding-reimbursement/sleep-medicine-codes/
32. Gambino F, Zammuto MM, Virzi A, Conti G, Bonsignore MR. Treatment options in obstructive sleep apnea. *Intern Emerg Med*. 2022;17:971-978.
33. Ravesloot MJL, de Vries N. Reliable calculation of the efficacy of non-surgical and surgical treatment of obstructive sleep apnea revisited. *Sleep*. 2011;34(1):105–110.
34. Weaver TE, Grunstein RR. Adherence to continuous positive airway pressure therapy: the challenge to effective treatment. *Proc Am Thorac Soc*. 2008;5(2):173-178.
35. Centers for Medicare & Medicaid Services. Hypoglossal Nerve Stimulation for the Treatment of Obstructive Sleep Apnea. Accessed September 11, 2025. https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdId=38307&ver=12
36. Certal VF, Zaghi S, Riaz M, Vieira AS, Pinheiro CT, Kushida C, et al. Hypoglossal nerve stimulation in the treatment of obstructive sleep apnea: a systematic review and meta-analysis. *Laryngoscope*. 2015;125:1254–1264.

37. Strollo PJ, Soose RJ, Maurer JT, et al. Upper-airway stimulation for obstructive sleep apnea. *N Engl J Med*. 2014;4(370)-139-149.
38. Morse E, Suurna M. Hypoglossal nerve stimulator patient usage: patterns and trends over time. *Laryngoscope Investig Otolaryngol*. 2022;7:1652-1658.
39. Lenze NR, Alazawi D, Dailey M, Brown C, Hoff PT, Goldstein CA. Evaluating changes in hypoglossal nerve stimulator use over time and long-term adherence. *Sleep Breath*. 2025;29:249.
40. Uniken Venema JAM, Rosenmoller BRAM, de Vries N, et al. Mandibular advancement device design: a systematic review on outcomes in obstructive sleep apnea treatment. *Sleep Med Rev*. 2021;60:101557.
41. Yu M, Ma Y, Han F, Gao X. Long-term efficacy of mandibular advancement devices in the treatment of adult obstructive sleep apnea: a systematic review and meta-analysis. *PLOS One*. 2023;18(11):e0292832.
42. Zaghi S, Holty JEC, Certal V, Abdullatif J, Guilleminault C, Powell NB. Maxillomandibular advancement for treatment of obstructive sleep apnea: a meta-analysis. *JAMA Otolaryngol Head Neck Surg*. 2016;142;(1):58-66.
43. Zhou N, Ho JPTF, Visscher WP, Su N, Lobbezoo F, de Lange J. Maxillomandibular advancement for obstructive sleep apnea: a retrospective prognostic factor study for surgical response. *Sleep Breath*. 2023; 27:1567–1576.
44. Varghese R, Adams NG, Slocumb NL, Viozzi CF, Ramar K, Olson EJ. Maxillomandibular advancement in the management of obstructive sleep apnea. *Int J Otolaryngol*. 2012;Article ID 373025.
45. American Academy of Otolaryngology-Head and Neck Surgery. Position Statement: Uvulopalatopharyngoplasty. Accessed September 15, 2025. https://www.entnet.org/resource/position-statement-uvulopalatopharyngoplasty/
46. Maniaci A, Di Luca M, Lechien JR. Lateral pharyngoplasty vs. traditional uvulopalatopharyngoplasty for patients with OSA: systematic review and metaanalysis. *Sleep Breath*. 26:1539-1550.
47. Iannella G, Lechien JR, Perrone T, et al. Barbed reposition pharyngoplasty (BRP) in obstructive sleep apnea treatment: state of the art. *Am J Otolaryngol*. 2022;43:103197.

48. Sher AE. Upper airway surgery for obstructive sleep apnea. *Sleep Med Rev*. 2002;6:3:195-212.
49. Dieieva Y, Naumenko O. Evaluation and management in patients with obstructive sleep apnea. In: Carotenuto M, ed. *Obstructive Sleep Apnea: New Insights in the 21st Century. IntechOpen*; 2024:21-36.
50. Wang SH, Keenan BT, Wiemken A, Zang Y, Staley B, Sarwer DB. Effect of weight loss on upper airway anatomy and the apnea-hypopnea index. The importance of tongue fat. *Am J Respir Crit Care Med*. 2020;201(6):718-727.
51. Malhotra A, Heilmann CR, Banerjee KK, Dunn JP, Bunck MC, Bednarik J. Weight reduction and the impact on apnea-hypopnea index: a systematic meta-analysis. *Sleep Med*. 2024;121:26-31.
52. Lemstra M, Bird Y, Nwankwo C, Rogers M, Moraros J. Weight loss intervention adherence and factors promoting adherence: a meta-analysis. *Patient Prefer Adherence*. 2016;10:1547-1559.
53. Sharma AM, Birney S, Crotty M, et al. Determinants of adherence to obesity medication: a narrative review. *Obes Rev*. 2025;26:e13885.
54. Martens K, Pester BD, Hecht LM, Herb-Neff KM, Clark-Sienkiewicz SM. Adherence to post-operative appointments is associated with weight loss following bariatric surgery. *Obes Surg*. 2021;31:5494-5496.
55. Larjani S, Spivak I, Guo MH, et al. Preoperative predictors of adherence to multidisciplinary follow-up care postbariatric surgery. *Surg Obes Relat Dis*. 2016;12:350-356.

Notes

Notes

Lilly A MEDICINE COMPANY