RESEARCH LETTER

GLP-1 Receptor Agonist and Bariatric Surgery Utilization Among Adolescents and Young Adults

The prevalence of severe obesity continues to increase among US adolescents and young adults (AYAs),[1,2] underscoring the need for effective weight management strategies. Concurrently, the clinical landscape of obesity treatment options has rapidly evolved with the uptake of highly effective glucagon-like peptide-1 receptor agonists (GLP-1 RAs), in addition to the established modality of metabolic and bariatric surgery (MBS), in adults and adolescents.[3] While both therapies are effective, little is known about population-level patterns and combined or sequential use of MBS and GLP-1 RAs among AYAs. We conducted this study to understand these patterns, which is critical for informing clinical decision-making, optimizing treatment sequencing, and identifying emerging patterns.

Supplemental content

Methods | This retrospective analysis leveraged data from Epic Cosmos,[4] a US-based electronic health record database representing more than 300 million patients. The University of Texas Southwestern Institutional Review Board deemed this cohort study exempt from ethics review and informed consent because it was not human participant research. We followed the STROBE reporting guideline.[5]

AYAs (aged 13-25 years) treated for obesity between May 2022 and January 2026 were included. Obesity treatments were categorized as GLP-1 RA only, MBS only, or combined GLP-1 RA and MBS. The analytic sample was restricted to individuals with obesity, defined in the current American Academy of Pediatrics clinical practice guidelines.[2] GLP-1 RAs were selected a priori due to their rapid uptake, strong evidence base for weight reduction, and increasing clinical use in pediatric populations; other antiobesity medications (eg, phentermine, topiramate) were not included to maintain this study's scope. Changes in the utilization of these treatments by age, sex, and self-reported race and ethnicity were evaluated using *P* for

Table 1. Demographic Characteristics of Adolescent and Young Adults, May 2022 to January 2026

Characteristic	Sample, No. (%)			*P* for trend
	Total (N = 204 148)	Adolescents (n = 39 282)[a]	Young adults (n = 164 866)[b]	
Age, mean (SD), y	21.3 (3.3)	15.8 (1.4)	22.6 (2.0)	<.001
BMI, mean (SD)	41.2 (8.1)	41.0 (7.8)	41.2 (8.2)	<.001
Sex				
Female	150 051 (73.5)	24 149 (61.5)	125 902 (76.4)	<.001
Male	54 001 (26.5)	15 120 (38.5)	38 881 (23.6)	
Race and ethnicity[c]				
Hispanic or Latino	36 680 (18.0)	7953 (20.2)	28 727 (17.4)	<.001
Non-Hispanic Asian	3518 (1.7)	579 (1.5)	2939 (1.8)	
Non-Hispanic Black	38 182 (18.7)	8994 (22.9)	29 188 (17.7)	
Non-Hispanic White	81 012 (39.7)	12 974 (33.0)	68 038 (41.3)	
Other, multiracial, or unknown[d]	44 756 (21.9)	8782 (22.4)	35 974 (21.8)	
Weight categories[e]				
Class I obesity	50 937 (25.0)	9427 (24.0)	41 510 (25.2)	<.001
Class II obesity	54 769 (26.8)	10 896 (27.7)	43 873 (26.6)	
Class III obesity	98 442 (48.2)	18 959 (48.3)	79 483 (48.2)	
Obesity treatment				
MBS only	9060 (4.4)	649 (1.7)	8411 (5.1)	<.001
GLP-1 RA only	192 013 (94.1)	38 189 (97.2)	153 824 (93.3)	
Combined MBS and GLP-1 RA	3075 (1.5)	444 (1.1)	2631 (1.6)	
Treated with GLP-1 RA before MBS	2106 (1.0)	343 (0.9)	1763 (1.1)	
Comorbidities				
Prediabetes	43 486 (21.3)	11 126 (28.3)	32 360 (19.6)	<.001
Metabolic syndrome	16 637 (8.1)	3916 (10.0)	12 721 (7.7)	<.001
Hypertension	38 827 (19.0)	6351 (16.2)	32 476 (19.7)	<.001
Anxiety	93 795 (45.9)	13 413 (34.1)	80 382 (48.8)	<.001
Depression	77 313 (37.9)	10 609 (27.0)	66 704 (40.5)	<.001
Fatty liver	25 370 (12.4)	5416 (13.8)	19 954 (12.1)	<.001

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); GLP-1 RA, glucagon-like peptide-1 receptor agonist; MBS, metabolic and bariatric surgery.

[a] Adolescents are aged 13 to 18 years.

[b] Young adults are aged 19 to 25 years.

[c] Race and ethnicity were self-reported. These data were included in the analysis because race and ethnicity may serve as proxies for social and structural factors that affect the utilization of MBS, GLP-1 RAs, or both.

[d] Other category included Pacific Islander or Native Hawaiian/Alaskan, Native American, biracial, multiracial, or unknown.

[e] For adolescents: class I obesity is defined as BMI at 95th percentile to 120% of the 95th percentile for age and sex; class II obesity, BMI between 120% to 140% of the 95th percentile; and class III obesity, BMI at 140% or above the 95th percentile. For young adults: class I obesity is defined as BMI of 30.0 to 34.9; class II obesity, BMI of 35.0 to 39.9; and class III obesity, BMI of 40.0 or higher.

Table 2. Distribution of Sample Descriptive Characteristics by Obesity Therapy Among Adolescents and Young Adults, May 2022 to January 2026

Characteristic	Adolescents and young adults, No. (%)			*P* for trend
	GLP-1 RA only (n = 192 013)	MBS only (n = 9060)	Combined GLP-1 RA and MBS (n = 3075)	
Age group				
Adolescent: 13-18 y	38 189 (97.2)	649 (1.7)	444 (1.1)	<.001
Young adult: 19-25 y	153 824 (93.3)	8411 (5.1)	2631 (1.6)	
Sex				
Female	140 282 (93.5)	7318 (4.9)	2451 (1.6)	<.001
Male	51 643 (95.6)	1735 (3.2)	623 (1.2)	
Race and ethnicity				
Hispanic or Latino	32 703 (89.2)	3219 (8.8)	758 (2.1)	<.001
Non-Hispanic Asian	3424 (97.3)	60 (1.7)	34 (1.0)	
Non-Hispanic Black	35 597 (93.2)	1792 (4.7)	793 (2.1)	
Non-Hispanic White	78 076 (96.4)	2004 (2.5)	932 (1.2)	
Other, mixed, or unknown	42 213 (94.3)	1985 (4.4)	558 (1.2)	
Weight categories[a]				
Class I obesity	47 475 (93.2)	2813 (5.5)	649 (1.3)	<.001
Class II obesity	51 521 (94.1)	2482 (4.5)	766 (1.4)	
Class III obesity	93 017 (94.5)	3765 (3.8)	1660 (1.7)	
Comorbidities				
Prediabetes	40 463 (93.0)	1927 (4.4)	1096 (2.5)	<.001
Metabolic syndrome	15 197 (91.3)	891 (5.4)	549 (3.3)	<.001
Hypertension	35 621 (91.7)	2190 (5.6)	1016 (2.6)	<.001
Anxiety	88 767 (94.6)	3309 (3.5)	1719 (1.8)	<.001
Depression	72 932 (94.3)	2865 (3.7)	1516 (2.0)	<.001
Fatty liver	22 341 (88.1)	2046 (8.1)	983 (3.9)	<.001
Year of treatment initiation				
May 2022-Nov 2022	7947 (88.2)	1050 (11.6)	16 (0.2)	<.001
Dec 2022-May 2023	14 166 (93.1)	1105 (6.7)	27 (0.2)	
June 2023-Nov 2023	17 077 (93.6)	1124 (6.2)	36 (0.2)	
Dec 2023-May 2024	21 172 (94.3)	1257 (5.6)	34 (0.2)	
June 2024-Nov 2024	31 641 (95.6)	1374 (4.2)	70 (0.2)	
Dec 2024-May 2025	39 579 (96.0)	1565 (3.8)	86 (0.2)	
June 2025-Jan 2026	62 402 (96.1)	2379 (3.7)	131 (0.2)	

Abbreviations: GLP-1 RA, glucagon-like peptide-1 receptor agonist; MBS, metabolic and bariatric surgery.

[a] For adolescents: class I obesity is defined as body mass index (BMI; calculated as weight in kilograms divided by height in meters squared) at 95th percentile to 120% of the 95th percentile for age and sex; class II obesity, BMI between 120% to 140% of the 95th percentile; and class III obesity, BMI at 140% or above the 95th percentile. For young adults: class I obesity is defined as BMI of 30.0 to 34.9; class II obesity, BMI of 35.0 to 39.9; and class III obesity, BMI of 40.0 or higher.

trends. Adherence to GLP-1 RAs was assessed using proportion of days covered (PDC), with 80% or greater PDC indicating adherence.[6]

Two-sided $P < .05$ indicated statistical significance. Data analysis was performed within the Epic Cosmos environment (Epic Systems Corporation) using Python 3.12.10 (Python Software Foundation).

Results | The study included 204 148 AYAs (mean [SD] age, 21.3 [3.3] years; 150 051 females [73.5%]) who were treated with GLP-1 RAs (192 013 [94.1%]), MBS (9060 [4.4%]), or a combination of both therapies (3075 [1.5%]). The most common comorbidities were anxiety (93 795 [45.9%]) and depression (77 313 [37.9%]) (**Table 1**). The proportion of exclusive GLP-1 RA use increased from 88.2% in May to November 2022 to 96.1% from June 2025 to January 2026 (*P* for trend < .001); MBS completion decreased from 11.6% to 3.7% (*P* for trend < .001), and combined GLP-1 RA and MBS remained stable at 0.2% during the same period (**Table 2**). Among individuals receiving both therapies, 2106 (72.3%) initiated GLP-1 RA before MBS, and 808 (27.7%) initiated GLP-1 RA after MBS. Median (IQR) time was shorter from GLP-1 RA initiation to MBS completion than from MBS completion to GLP-1 RA initiation (339 [185.0-561.8] vs 434 [206.2-685.2] days). Among AYAs receiving GLP-1 RAs, 131 818 (67.6%) were adherent (≥80% PDC), with higher adherence among males than females (37 887 [72.5%] vs 93 867 [65.8%]; *P* for trend < .001).

Exclusive GLP-1 RA use was observed in a larger proportion of adolescents vs young adults (97.2% vs 93.3%; *P* for trend < .001), males vs females (95.6% vs 93.5%; *P* for trend < .001), and in non-Hispanic Asian vs non-Hispanic White individuals (97.3% vs 96.4%; *P* for trend < .001) (Table 2). In contrast, MBS completion was observed in a larger proportion of young adults vs adolescents (5.1% vs 1.7%; *P* for trend < .001), females vs males (4.9% vs 3.2%; *P* for trend < .001), and Hispanic or Latino and non-Hispanic Black vs non-Hispanic White individuals (8.8% and 4.7% vs 2.5%; *P* for trend < .001) (Table 2). Combined therapy was more

common among young adults vs adolescents (1.6% vs 1.1%; *P* for trend < .001), females vs males (1.6% vs 1.2%; *P* for trend < .001), and Hispanic or Latino and non-Hispanic Black vs non-Hispanic White individuals (both 2.1% vs 1.2%; *P* for trend < .001).

Discussion | GLP-1 RA use among AYAs seeking obesity care increased substantially (88.2% to 96.1%) from 2022 to 2026, outpacing MBS utilization, which declined markedly (11.6% to 3.7%). These findings suggest a rapid shift in treatment pathways, with pharmacotherapy increasingly functioning as the initial intervention for youths with obesity. Combined therapy remained rare throughout the study period (0.2%), with most individuals initiating GLP-1 RA before MBS. Persistent differences across sex and races and ethnicities suggest heterogeneity in treatment pathways rather than uniform disparities in access. We could not determine from these data whether the decline in MBS was associated with substitution by pharmacotherapy, differences in insurance coverage, changes in referral practices, or evolving patient preferences.

Study limitations include its focus on GLP-1 RAs and MBS and exclusion of other antiobesity medications, such as phentermine or topiramate, which may underestimate the overall use of pharmacologic obesity treatments in AYAs. These findings underscore the rapid transformation of obesity care for AYAs and highlight the need for evidence-based guidance on treatment sequencing and long-term outcomes.

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Accepted for Publication: May 9, 2026.

Published Online: July 20, 2026. doi:10.1001/jamapediatrics.2026.2828

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Conflict of Interest Disclosures: Dr Messiah reported receiving grants from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), and National Institute on Minority Health and Health Disparities of the National Institutes of Health (NIH) outside the submitted work. Dr Ernest reported receiving training grant from the Cancer Prevention and Research Institute of Texas (CPRIT) outside the submitted work. Dr Cartwright reported receiving grants from American Diabetes Association and personal fees from American Board of Obesity Medicine outside the submitted work. Dr Qureshi reported receiving personal fees from Eticon outside the submitted work. Dr Almandoz reported receiving personal fees from AbbVie, Amgen, Boehringer Ingelheim, Eli Lilly, Haleon, Kailera, Metsera, Novo Nordisk, Pfizer, Rhythm, and Rivus outside the submitted work. Dr Barlow reported receiving grants from the NICHD and personal fees from UpToDate outside the submitted work. No other disclosures were reported.

Funding/Support: This research was supported by award P30DK127984 from the NIDDK of the NIH and award UL1 TR003163 from the National Center for Advancing Translational Sciences of the NIH.

Role of the Funder/Sponsor: The funders had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Disclaimer: The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH, CPRIT, or Epic Systems Corporation.

Data Sharing Statement: See the Supplement.

Additional Contributions: We thank Epic Systems Corporation for providing free access to the Epic Cosmos database used in this study.

1. Noiman A, Fryar CD, Saif NT, Afful J. Prevalence of overweight, obesity, and severe obesity among children and adolescents ages 2-19 years: United States, 1963-1965 through August 2021-August 2023. *NCHS Health E-Stat*. 2024. doi:10.15620/cdc/174645

2. Hampl SE, Hassink SG, Skinner AC, et al. Clinical practice guideline for the evaluation and treatment of children and adolescents with obesity. *Pediatrics*. 2023;151(2):e2022060640. doi:10.1542/peds.2022-060640

3. Lin K, Mehrotra A, Tsai TC. Metabolic bariatric surgery in the era of GLP-1 receptor agonists for obesity management. *JAMA Netw Open*. 2024;7(10):e2441380. doi:10.1001/jamanetworkopen.2024.41380

4. Noel A, Bartelt K. Cosmos: real-world data powered by the healthcare community. *J Soc Clin Data Manag*. 2023;3(S1):1-4. doi:10.47912/jscdm.246

5. Simera I, Moher D, Hirst A, Hoey J, Schulz KF, Altman DG. Transparent and accurate reporting increases reliability, utility, and impact of your research: reporting guidelines and the EQUATOR Network. *BMC Med*. 2010;8(1):24. doi:10.1186/1741-7015-8-24

6. Martin BC, Wiley-Exley EK, Richards S, Domino ME, Carey TS, Sleath BL. Contrasting measures of adherence with simple drug use, medication switching, and therapeutic duplication. *Ann Pharmacother*. 2009;43(1):36-44. doi:10.1345/aph.1K671