Real-World Glucagon-Like Peptide-1 Use and Association With Clinical Characteristics, Social Determinants, and Circulating Tumor DNA Positivity in Patients With Breast Cancer

Cleo A. Ryals, PhD[1]; Auriane Blarre, MEng[1]; Blythe Adamson, PhD, MPH[1]; Daniel Bower, MS[1]; Gene G. Ho, MPH[1]; Olive Mbah, PhD, MHS[1]; Selina Radlein, MPH[1]; Erin Fidyk, MSN, MBA[1]; Fatima Cody Stanford, MD, MPH, MPA, MBA[2]; Aaron B. Cohen, MD, MSCE[1,3]

[1]Flatiron Health, New York, NY; [2]Massachusetts General Hospital, MGH Weight Center, Department of Medicine-Neuroendocrine Unit, Department of Pediatrics-Endocrinology, Boston Area Nutrition Obesity Research Center, Harvard Medical School, Boston, Massachusetts; [3]Department of Medicine, Grossman School of Medicine, New York University, NY

Introduction

- Obesity is a known risk factor for breast cancer (BC) incidence and recurrence. Glucagon-like peptide-1 (GLP-1) medications have emerged as effective treatments for weight management, with potential implications for oncology supportive care
- However, their real-world use and impact among patients with BC remain poorly characterized
- We extracted information from the electronic health records (EHRs) using AI extraction techniques to assess (1) documentation of GLP-1 use among patients with BC; (2) clinical, sociodemographic, and social determinants of health (SDOH) factors associated with GLP-1 use; and (3) the association between GLP-1 use and circulating tumor DNA (ctDNA) testing and test results among a US-based cohort of patients with BC

Methods and Materials

- **Data Source:** This study used the US-based, EHR-derived deidentified Flatiron Health Research Database (FHRD)[1]
- **Cohort:** The study included females ≥18 years, diagnosed with BC between January 2011 and February 2025
- **Main Outcome Variables:** We used machine learning, deep learning, and large language model (LLM)-prompting techniques to extract (1) GLP-1 medication use and (2) ctDNA testing details from unstructured EHR documents
- **Statistical Analysis:** We estimated a series of multivariable logistic regression models assessing associations between patient characteristics and GLP-1 use (i.e., documentation of GLP-1 use in EHR), sequentially adjusting for clinical factors (e.g., age, stage, year of diagnosis), sociodemographics (e.g., race/ethnicity) and SDOH (e.g., telemedicine use, practice setting, urban/rural)
- In exploratory analyses, we also estimated the unadjusted association between GLP-1 use and ctDNA testing (yes vs. no) and result (positive vs. negative) at any time

References

1. Flatiron Health. Database Characterization Guide. Flatiron.com. Published March 18, 2025. Accessed October 13, 2025. https://flatiron.com/database-characterization
2. Picon-Ruiz M, Morata-Tarifa C, Valle-Goffin JJ, Friedman ER, Slingerland JM. Obesity and adverse breast cancer risk and outcome: Mechanistic insights and strategies for intervention. CA Cancer J Clin. 2017 Sep;67(5):378-397. doi: 10.3322/caac.21405. Epub 2017 Aug 1
3. Lin A, Ding Y, Li Z, Jiang A, Liu Z, Wong HZH, Cheng Q, Zhang J, Luo P. Glucagon-like peptide 1 receptor agonists and cancer risk: advancing precision medicine through mechanistic understanding and clinical evidence. Biomark Res. 2025 Mar 27;13(1):50
4. Estevez M, Singh N, Dyson L, Adamson B, Yuan Q, Hildner MW, Fidyk E, Mbah O, Khan F, Seidl-Rathkopf K, Cohen AB. Ensuring Reliability of Curated EHR-Derived Data: The Validation of Accuracy for LLM/ML-Extracted Information and Data (VALID) Framework. arXiv preprint arXiv:2506.08231. 2025 Jun 9

Acknowledgments: Darren Johnson, PhD (Flatiron Health, Inc.) provided publication management support and Marissa Jones, MFA (Flatiron Health, Inc.) provided design support. Data first presented at SABCS in San Antonio, TX on December 11, 2025.
Disclosures: This study was sponsored by Flatiron Health, Inc.—an independent member of the Roche Group. During the study period, CAR, AB, BA, DB, GH, OM, SR, EK, and AC reported employment with Flatiron Health, Inc. and stock ownership in Roche.
Author contact information: Cleo A. Ryals, PhD cleo.ryals@flatiron.com

Results

Participants: Among the 967,968 patients diagnosed with BC in the FHRD, 708,406 patients were included in our study cohort. Within our study cohort, 53,694 (7.6%) patients had documented evidence of GLP-1 use (**Table 1**)

Table 1. Demographics of Patients Included in the Study

Characteristics	Non-GLP-1 users, No. (%) (n = 654,712)	GLP-1 users, No. (%) (n = 53,694)
Age, y		
18-49	118,718 (18%)	11,711 (22%)
50-64	226,768 (35%)	24,139 (45%)
65-74	184,645 (28%)	13,846 (26%)
75+	124,581 (19%)	3,998 (7.4%)
Race/ethnicity		
NL-Asian	16,946 (2.6%)	904 (1.7%)
NL-Black	79,316 (8.8)	7,484 (14%)
Latinx	51,317 (7.8%)	4,056 (7.6%)
NL-White	395,740 (60%)	32,870 (61%)
Other race/missing	181,196 (20.1)	9980 (15.5)
Practice type		
Academic	105,144 (16%)	11,598 (22%)
Community	528,904 (81%)	40,119 (75%)
Both	20,664 (3.2%)	1,977 (3.7%)
Obesity (ever had BMI ≥30)		
No documented BMI ≥30	473,095 (72%)	27,511 (51%)
BMI ≥30	181,617 (28%)	26,183 (49%)

NL: Non-Latinx; BMI: Body Mass Index

Associations Between Clinical Characteristics and GLP-1 Use

- GLP-1 use was higher among:
  - Patients with BMI ≥30 (vs. BMI <30; Odds Ratio [OR]=2.36; 95%CI: 2.32-2.40)
- GLP-1 use was lower among:
  - HR-/HER2- patients (vs. HR+/HER2-; OR=0.86; 95%CI: 0.83-0.89)
  - Older patients (aged >75 vs. aged 18-49; OR=0.32; 95%CI: 0.31-0.33)
  - Advanced stage patients (stage IV vs. stage I-III OR=0.47; 95%CI: 0.45-0.49)

Associations Between Race/Ethnicity and GLP-1 Use

- GLP-1 use was higher among:
  - NL-Black patients (vs. NL-White; OR=1.30; 95%CI: 1.26-1.34)
- GLP-1 use was lower among:
  - Latinx patients (vs. NL-White; OR=0.94; 95%CI: 0.90-0.97)
  - Asian patients (NL-White; OR=0.67; 95%CI: 0.62-0.71)

Associations Between SDOH and GLP-1 Use

- GLP-1 use was higher among:
  - Telemedicine users (vs. non-users; OR=1.43; 95%CI: 1.39-1.45)
  - Patients living in rural areas (vs. urban; OR=1.09; 95%CI: 1.06-1.13)
- GLP-1 use was lower among:
  - Patients living in areas with the highest levels of limited English proficiency [LEP] (vs. lowest LEP; OR=0.86; 95%CI: 0.82-0.89)
  - Patients at community practices (vs. academic; OR=0.78; 95%CI: 0.77-0.80)

Figure 1. Clinical Predictors of GLP-1 Use

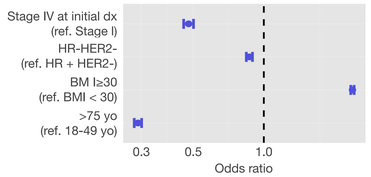


Figure 2. Race/Ethnicity Predictors of GLP-1 Use

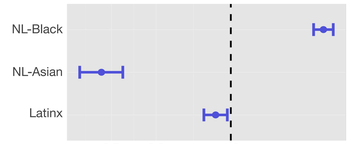
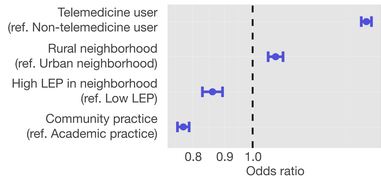


Figure 3. SDOH Predictors of GLP-1 Use



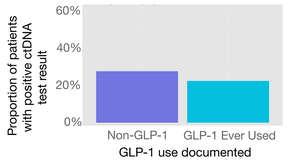
Documented Reasons for GLP-1 Use

- The most commonly documented reasons for GLP-1 use included:
  - Diabetes management
  - Weight loss
- Less common reasons included:
  - Cardiovascular/cholesterol issues
  - Obstructive sleep apnea

ctDNA Testing and Positivity Rates by GLP-1 Use

- Compared with non-users, GLP-1 users had
  - Higher rates of ctDNA testing (2.8% vs. 1.5% [not shown]; OR=1.84; 95%CI: 1.75-1.93)
  - Lower rates of ctDNA positivity (25.8% vs 31.6% (**Figure 4**); OR=0.76; 95%CI: 0.67-0.85)

Figure 4. ctDNA Positivity by GLP-1 Use



Among patients with breast cancer, **GLP-1 use** is influenced by clinical, sociodemographic, and SDOH factors, and is associated with **lower rates of ctDNA positivity**

Discussion

- Clinical, sociodemographic, and SDOH factors are linked to GLP-1 use among patients with BC. Additionally, GLP-1 use was associated with lower ctDNA positivity, an early indicator of minimal residual disease and a strong predictor of recurrence, highlighting a potentially meaningful biologic or behavioral signal.
- Moreover, this study demonstrates the feasibility of using LLMs to accurately extract GLP-1 medication details from the EHR
- Given the observational and exploratory nature of this study, additional research is needed to further tease apart associations between GLP-1 use and BC outcomes
- However, this study lays critical groundwork for future research evaluating the clinical impact of GLP-1 use on BC outcomes and recurrence risk, as well as equitable access to these therapies

Scan to read the abstract

Copies of this poster obtained through Quick Response (QR) Code are for personal use only and may not be reproduced without permission from SABCS® and the author of this poster.