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Original article

# Use of prescribed opioids before and after bariatric surgery: prospective evidence from a U.S. multicenter cohort study

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**Abstract**

**Background:** Limited evidence suggests bariatric surgery may not reduce opioid analgesic use, despite improvements in pain.

**Objective:** To determine if use of prescribed opioid analgesics changes in the short and long term after bariatric surgery and to identify factors associated with continued and postsurgery initiated use.

**Setting:** Ten U.S. hospitals.

**Methods:** The Longitudinal Assessment of Bariatric Surgery-2 is an observational cohort study. Assessments were conducted presurgery, 6 months postsurgery, and annually postsurgery for up to 7 years until January 2015. Opioid use was defined as self-reported daily, weekly, or "as needed" use of a prescribed medication classified as an opioid analgesic.

**Results:** Of 2258 participants with baseline data, 2218 completed follow-up assessment(s) (78.7% were female, median body mass index: 46; 70.6% underwent Roux-en-Y gastric bypass). Prevalence of opioid use decreased after surgery from 14.7% (95% CI: 13.3–16.2) at baseline to 12.9% (95% CI: 11.5–14.4) at month 6 but then increased to 20.3%, above baseline levels, as time progressed (95% CI: 18.2–22.5) at year 7. Among participants without baseline opioid use (n = 1892), opioid use prevalence increased from 5.8% (95% CI: 4.7–6.9) at month 6 to 14.2% (95% CI: 12.2–16.3) at year 7. Public versus private health insurance, more pain presurgery, undergoing subsequent

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surgeries, worsening or less improvement in pain, and starting or continuing nonopioid analgesics postsurgery were significantly associated with higher risk of postsurgery initiated opioid use.
**Conclusion:** After bariatric surgery, prevalence of prescribed opioid analgesic use initially decreased but then increased to surpass baseline prevalence, suggesting the need for alternative methods of pain management in this population. (Surg Obes Relat Dis 2017;▮:00–00.) 

*Keywords:* Severe obesity; Bariatric surgery; Roux-en-Y gastric bypass; Laparoscopic adjustable gastric band; Medication; Opioid; Narcotic; Analgesia; Pain

In the last 3 decades, efforts to improve patient care [1,2] have led to a significant increase in prescriptions for opioid analgesics to manage acute severe and chronic pain [3,4]. An epidemic of opioid abuse, addiction, and overdose has been an unforeseen consequence [5]. Given recent reports suggesting that several surgical procedures are associated with an increased risk of chronic opioid use [6], coupled with evidence that bariatric surgery patients are overrepresented in substance use treatment facilities and that Roux-en-Y gastric bypass (RYGB) increases the risk of alcohol use disorder [7], there is growing concern over opioid analgesic use among bariatric surgery patients.

Severe obesity increases risk of pain via mechanical factors, chemical mediators, depression, and lifestyle [8]. Bariatric surgery is an effective treatment for severe obesity, resulting in long-term weight loss and improvement in many co-morbidities [9,10], including musculoskeletal and nonspecific pain and headaches [11–14]. However, these improvements may not be followed by a reduction in use of opioid analgesics [15,16] for a number of reasons. First, due to an increased risk of marginal ulcers, nonsteroidal anti-inflammatory drugs (NSAIDs) are contraindicated after bariatric surgery [17], leaving fewer nonopioid analgesic options. Second, administering systemic opioid therapy for short-term postoperative pain may increase the risk for chronic opioid use [6,18,19]. Third, RYGB accelerates the rate of morphine solution absorption [20] and, in animal models, has been shown to increase motivation for taking morphine [21]. Collectively, these data suggest that the risk for opioid use and dependence may increase after at least some bariatric surgical procedures.

Using a large multisite cohort study with 7-year follow-up, this study evaluated short- and long-term changes in use of prescribed opioid analgesics and identified factors associated with continuation and postsurgery initiation of such use.

## Methods

### *Participants*

The Longitudinal Assessment of Bariatric Surgery-2 (LABS-2) study is an observational study of 2458 adults who underwent an initial bariatric surgical procedure as part of clinical care between March 14, 2006 and April 24, 2009 at 1 of 10 hospitals at 6 clinical centers in the United States [22,23]. The institutional review boards at each center approved the protocol, and all participants gave written informed consent to participate in the study. The study is registered at https://www.clinicaltrials.gov/ct2/show/NCT00465829.

Baseline assessments were conducted by research staff independent of clinical care after clearance for surgery and within 30 days before scheduled surgery date. Follow-up assessments were conducted at 6 months and then annually after surgery, within 6 months of the surgery anniversary date, for 7 years or until January 31, 2015. Participants who completed the baseline and at least 1 follow-up medication assessment were included in this report (n = 2218; Supplementary eFigure 1).

### *Collection of data*

*Prescription analgesic medication use*. Participants were asked to bring their prescription medication bottles from the past 90 days to research assessments, during which they completed the LABS-2 Medication Form [23]. The form instructed participants to "print the name (as listed on your medication bottle) of each prescription medication that you have taken in the past 90 days." Participants were then asked if they took each medication daily ($\geq$1 times/d), weekly (1–6 times/wk), monthly/rarely (0–3 times/mo), as needed, or if they were no longer taking it. Indication and dose were not assessed. Participants who forgot their medication bottles or could not attend an in-person assessment were able to complete the form at home and return it by mail.

Therapeutic and pharmacologic classes of medications were used to determine use of opioid analgesic medications (opioid agonist alone or in combination with acetaminophen, a barbiturate, an NSAID, or a salicylate/aspirin; or opioid agonist/antagonist with acetaminophen) and nonopioid analgesic medications most commonly used for pain (acetaminophen alone or in combination with anything except an opioid agonist; aspirin or other salicylate in combination with anything except an opioid agonist; skeletal muscle relaxant; cyclooxygenase-2 selective or nonselective NSAID). Medications typically prescribed for opioid dependency were identified by therapeutic and