

## **Research into the relationship between BMI and Total Joint Replacement Success**

<https://bit.ly/4awu5hK>

This is an admittedly one-sided selection of research; other research supporting BMI limitations and weight-loss recommendations for patients in need of total joint replacement can easily be found. Nonetheless, this list of papers making the case for diminishing BMI as a gatekeeper is far from comprehensive. Physicians and surgeons may find it sufficient to re-evaluate some of their practices.

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**Title:** Functional Gain and Pain Relief After Total Joint Replacement According to Obesity Status

[https://journals.lww.com/jbjsjournal/Abstract/2017/07190/Functional\\_Gain\\_and\\_Pain\\_Relief\\_After\\_Total\\_Joint.4.aspx](https://journals.lww.com/jbjsjournal/Abstract/2017/07190/Functional_Gain_and_Pain_Relief_After_Total_Joint.4.aspx)

**Conclusions:** Six months after total joint replacement (TJR), severely or morbidly obese patients reported excellent pain relief and substantial functional gain that was similar to the findings in other patients. While obesity is associated with a greater risk of early complications, obesity in itself should not be a deterrent to undergoing TJR to relieve symptoms.

**Study size:** 2,040 THR, 2960 TKR

**Published:** *Journal of Bone and Joint Surgery*, July 19, 2017

**Authors:** Li, Wenjun PhD; Ayers, David C. MD; Lewis, Courtland G. MD; Bowen, Thomas R. MD; Allison, Jeroan J. MD, MS; Franklin, Patricia D. MD, MBA, MPH

“Patients undergoing THR were an average of 65 years of age; 59% were women, 94% were white, and 14% were severely or morbidly obese. A greater obesity level was associated with a lower (worse) PCS score at baseline and 6 months postoperatively. Severely and morbidly obese patients had less postoperative functional gain than the other BMI groups. A greater obesity level was associated with more pain at baseline but greater postoperative pain relief, so the average postoperative pain scores did not differ significantly according to BMI status. Patients undergoing TKR had an average age of 69 years; 61% were women, 93% were white, and 25% were severely or morbidly obese. A greater obesity level was associated with a lower PCS score at baseline and 6 months. **The postoperative gain in PCS score did not differ by BMI level.** A greater obesity level was associated with worse pain at baseline **but greater pain relief at 6 months**, so the average pain scores at 6 month were similar across the BMI levels.”

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**Title:** A critical review of weight loss recommendations before total knee arthroplasty

<https://pubmed.ncbi.nlm.nih.gov/33278590/> (Full paper not available without subscription)

**Conclusions:** Evidence to support a benefit of weight loss prior to TKA is lacking. **Until knowledge gaps are clarified, it is recommended that practitioners consider individual patient needs and risk before recommending weight loss (and therefore BMI reduction).**

**Published:** *Journal of Joint, Bone and Spine*, 2021 Mar;88(2):105114. doi: 10.1016/j.jbspin.2020.105114. Epub 2020 Dec 2.

**Authors:** Kristine Godziuk-, Carla M Prado, Lauren Beaupre, C Allyson Jones, Jason R Werle, Mary Forhan

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**Title:** Effect of non-surgical, non-pharmacological weight loss interventions in patients who are obese prior to hip and knee arthroplasty surgery: a rapid review

<https://pubmed.ncbi.nlm.nih.gov/26410227/>

**Conclusions:** There is limited evidence to support the recommendation of weight loss in the year prior to TJA and to determine the effectiveness of short-term non-pharmacological, non-surgical weight management interventions on patient and surgical outcomes.

**Published:** *Systematic Reviews* 2015 Sep 27;4:121. doi: 10.1186/s13643-015-0107-2.

**Authors:** Michelle Lui, C Allyson Jones, Marie D Westby

“In one of two high-quality retrospective cohort studies, **weight loss  $\geq$ 5 % of body weight in the year prior to TJA and maintained in the year after surgery was associated with a higher likelihood of deep surgical site infection in THA patients and 90-day readmission in TKA patients. No significant differences were reported in incidence of superficial surgical site infections in THA or TKA patients who lost weight pre-operatively compared to those who maintained their weight in either study.**”

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**Title:** Obesity and revision surgery, mortality, and patient-reported outcomes after primary knee replacement surgery in the National Joint Registry: A UK cohort study

<https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003704>

**Conclusions:** Given revision estimates in all BMI groups below the recognised threshold, no evidence of increased mortality, and difference in change in OKS below the MDC, **this large national registry shows no evidence of poorer outcomes in patients with high BMI. This study does not support rationing of TKR based on increased BMI.**

**Published:** *Public Library of Science* (peer-reviewed), July 16, 2021

**Sample size:** 493,701

**Authors:** Jonathan Thomas Evans, Sofia Mouchti, Ashley William Blom, Jeremy Mark Wilkinson, Michael Richard Whitehouse, Andrew Beswick, Andrew Judge

“There does not appear to be any evidence to support clinically relevant worse outcomes following TKR for patients with a raised BMI in the NJR between 2005 and 2016.

“**These findings do not support restriction of referral for knee replacement based on BMI alone.** It appears that even if some patients with raised BMI are at risk of poorer outcomes, the outcomes remain acceptable by contemporary standards, and the selection process of orthopaedic surgeons is effective at identifying the correct patients to operate on at a population level.”

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**Title:** Operative Techniques to Reduce Hip and Knee Arthroplasty Complications in Morbidly Obese Patients

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9445224/>

**Partial abstract:** For some surgeons, patient selection criteria for TJA includes BMI<40. The associated risks are recognized by The American Association of Hip And Knee Surgeons, and many surgeons follow these guidelines. **Importantly, as obese patients have been demonstrated to have equal or greater gains in functional outcomes and quality of life metrics, it is important for obese patients to have access to TJA.**

Through a comprehensive literature review and structured interviews with leading surgeons in the field, we provide guidance for orthopedic surgeons treating patients with BMI>40 to minimize risks, including tailored preoperative, intraoperative, and postoperative considerations.

Published: [Arthroplast Today](#). 2022 Oct; 17: 120–125. Published online 2022 Aug 29.

doi: [10.1016/j.artd.2022.07.016](https://doi.org/10.1016/j.artd.2022.07.016)

PMCID: PMC9445224

PMID: [36082285](#)

Authors: Kelsey A. Rankin, BA, David Gibson, MD, Ran Schwarzkopf, MD, Mary I. O'Connor, MD, and Daniel H. Wiznia, MD

“Through a comprehensive literature review and structured interviews with leading surgeons in the field, we provide guidance for orthopedic surgeons treating patients with BMI>40 to minimize risks, including tailored preoperative, intraoperative, and postoperative considerations.

“This literature review covers many factors, including recommending weight loss of ~5%, **while also being very clear about the ethical complications of refusing knee replacement surgery to obese people**, providing many suggestions for modifying the simple BMI standard based on factors such as metabolic syndrome and malnutrition, and recommending pre-, intra-, and post- operative controls to minimize the risks.”

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While it is easy to find reputable scientific studies and papers regarding the relationship of BMI to total knee replacement, it is much harder to sift through the amount of undocumented statistics about success or failure of weight loss attempts, whether they be personal, surgical, or medical. In almost every case, studies that show the extreme high failure rate of weight loss attempts conclude by saying that some different approach will likely be more successful, without providing studies that demonstrate the predicted successes.

For a comprehensive review of the complications, we commend

**Title:** What could be the reasons for not losing weight even after following a weight loss program?

**Conclusion:** This review identifies and clarifies the role of several factors that may hinder weight loss after the exploration of existing evidence. Judging the effectiveness of respective lifestyle interventions by simply observing the ‘general behavior of the groups’ is not always applicable in clinical practice. Each individual must be monitored and advised as per their requirements and challenges

**Published:** *Journal of Health, Population, and Nutrition*, March 2, 2024

**Authors:** Jyoti Dabas, S. Shunmukha Priya, Akshay Alawani & Praveen Budhrani

For convenience, we have reproduced the authors’ outline of complicating factors:

- I. Biological
  - a. Genetic
  - b. Anthropometric
  - c. Biological/metabolic adaptations
- II. Medical

- a. Hypothyroidism and underactive thyroid
  - b. Polycystic ovarian syndrome
  - c. Contraceptive use
  - d. Medications
  - e. Surgery
  - f. Vitamin D deficiency
- III. Interventional factors
- a. Dietary adherence (3 subcategories)
  - b. Macronutrient based diets
  - c. Confidence and loss
  - d. Perceived discrimination
- IV. Lifestyle factors
- a. Sleep deprivation
  - b. Circadian misalignment
  - c. Hydration
  - d. Alcohol
  - e. Psychological factors
  - f. Ultra-processed foods
- V. Environmental factors
- a. Stress
  - b. Social support
  - c. Weather
  - d. Pollutants
  - e. Plastics

