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Development and Implementation of a Weight Management Referral Pathway Prior to Total Joint Arthroplasty

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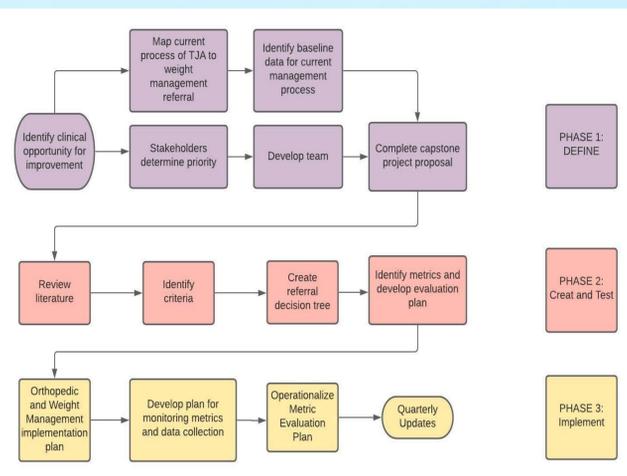
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- Obesity has become an increasingly prevalent public health problem in the United States, with approximately 40% of all U.S. adults fitting the criteria of a body mass index (BMI) ≥ 30 .¹ Elevated BMIs have been associated with worse surgical outcomes, including longer operative times, greater blood loss, greater risk of venous thromboembolic events, readmissions, infection, and revisions.^{2,3}
- Currently, Lehigh Valley Health Network (LVHN) orthopaedic patients are encouraged to lose weight and/or participate in a weight loss program to lower their BMI to less than 40 prior to total joint arthroplasty (TJA) surgeries, which include total knee and total hip arthroplasty. However, there is no standardized process for enrolling these patients with elevated BMI into the LVHN weight-management program. Additionally, patients referred to weight-management encounter long enrollment wait-lists. This project aims to create a standardized, evidence-based pathway for TJA patients to be referred to a streamlined weight management program.

Problem Statement

Would the implementation a weight management referral pathway (consisting of a decision tree and TJA-specific weight management tract) prior to TJA increase the number of patients referred into weight management, and secondarily increase the number of patients achieving a BMI of <40 prior to TJA and decrease TJA operating room case duration?

- Creation and implementation of the referral pathway involved collaboration and input from the department of orthopaedics and the weight management center. Figure 1 illustrates the steps in this pathway. Figure 2 illustrates the referral decision tree. Data queries utilized an automated extraction based on Current Procedural Terminology (CPT) codes for hip and knee total arthroplasty. Data extraction included procedure type, operating room duration, patient height, and patient weight. Total joint arthroplasty patients were tracked by medical record number (MRN). Patients with a BMI ≥ 40 had MRN's cross-referenced with referrals made by the orthopaedics department to weight management.



- During the 2019 calendar year, the LVHN orthopaedics department performed 2189 joint replacement surgeries (combined hip and knee arthroplasties).
- Of those procedures, 272 or 12.4% were performed on patients with a BMI of equal to or greater than 40.
- Patients undergoing TJA with a BMI ≥ 40 had a statistically significantly longer case duration in minutes as compared to those with a BMI < 40 (120.3 min vs. 116.1 min, $P = 0.008$).
- During this time, only 80 referrals were made to weight management from the orthopaedic department, representing only 29.4% of potential eligible referrals.
- Initial efforts to implement the decision tree for referral were received with poor adoption. Feedback solicited from arthroplasty surgeons on challenges to implementation included differing clinician judgement on suitable surgical candidates, and the number and type of acceptable comorbidities.
- To date, no patients have successfully gone through the weight management referral pathway.

Characteristic	Total	BMI ≥ 40
Total Joint Arthroplasty Procedures	2189	272 (12.4%)
Hip	828	68 (8.2%)
Knee	1361	204 (15%)

Table 1. Breakdown of total joint arthroplasty patients in 2019 by procedure type and BMI

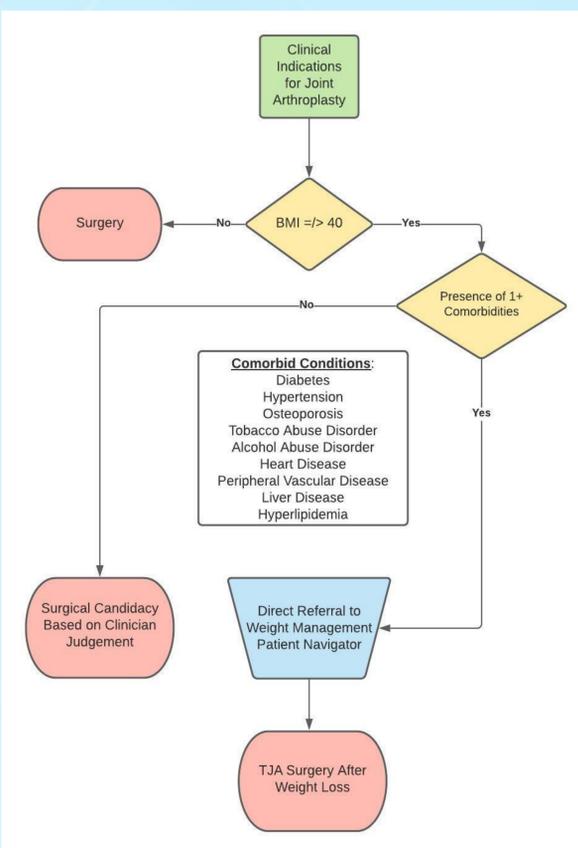


Figure 1. Final iteration of the referral decision tree

- Hospital operations are still adapting to best care for the obese patient population.⁴ At LVHN, the process for referral and enrollment of total joint arthroplasty patients into weight management remained inefficient for the current rate of obesity among patients.
- Analysis of LVHN orthopaedic patient baseline data revealed that less than 30% of eligible patients received referrals to the weight management program.
- Studies show patient-directed weight loss prior to TJA is has low success rates.⁵ This current project improves upon this by having a referral to the patient navigator and providing access to all weight loss interventions available through LVPG bariatric medicine
- The inefficiencies were approached in two parts – standardizing the referral process, and streamlining the patient enrollment process into weight management.
- This resulted in an easy-to-follow algorithm for patient referral and system changes to streamline the enrollment process into weight management.
- However, several challenges impeded the successful implementation of this direct referral system. This highlights competing priorities within the orthopaedics department: improve outcomes through referral to weight management, but also maintaining surgical volumes.
- Further work may focus on ways to efficiently expand the capacity and resources of the weight management center without compromising patient care.

- Data and feedback suggest that there is a need for a standardized and streamlined process for referral of TJA patients to weight management, and an improved enrollment process for referred patients.
- In its initial deployment there was poor adoption of the decision tree pathway.
- Solicited feedback includes hesitancy to delay surgery scheduling during ongoing Covid-19 surgery restrictions as well differing clinician judgement on suitable surgical candidates.
- Updated decision tree has proved to have better adoption but is in early stages of implementation

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