

Review Article

Pre-operative Weight Loss – Plan for Stepwise Incorporation of Registered Dietitian Nutritionists into an Orthopaedic Practice

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ABSTRACT

Approximately 40% of US adults have a body mass index that is considered obese. Joint replacements in patients with obesity come with an increased relative risk of infection, mechanical failure, and revision surgery. Therefore, preoperative weight loss is recommended for select patients in an attempt to improve postoperative outcomes. The incorporation of registered dietitian nutritionists has demonstrated significant improvement in patient weight loss when integrated into a clinical practice, however, this integration is often not utilized in orthopaedic clinics. The purpose of this review is to provide a stepwise plan to incorporate a registered dietitian nutritionist into an orthopaedic practice.

Keywords: Orthopedic surgery, Orthopedics, Arthroplasty, Hip replacement, Knee replacement

Introduction

Approximately 40% of adults and 20% of children in the United States have a body mass index (BMI) that is considered obese [1]. Obesity is defined as a BMI of over 30.0 kg/m [1,2]. There is a growing body of literature describing the impact of obesity on orthopaedic procedures and outcomes. Patients with elevated BMI undergo joint replacement at a younger age compared to those without an elevated BMI [2-4]. The increase in the prevalence of obesity parallels the demand for joint replacement. Joint replacement in patients with obesity comes with an increased relative risk of infection, mechanical failure, and revision surgery [5-14]. This has prompted several orthopaedic surgeons to attempt to incorporate various methods of weight loss prior to joint replacement to attempt to improve postoperative outcomes [15].

Pre-operative weight loss can be achieved by several strategies

including behavioral, surgical, and pharmaceutical options. Of these strategies, conservative measures with lifestyle modification through diet and exercise are the first line [16,17]. Although effective, lifestyle modifications are extremely difficult for many patients to adopt and adhere to over time. Utilizing an interdisciplinary approach to weight loss improves patient adherence to lifestyle modifications. Registered Dietitian Nutritionists (RDNs) play an important role in behavioral modification. RDNs are trained to educate, counsel, and support weight loss programs that help patients achieve and sustain significant weight reduction. The incorporation of RDNs into clinical practice to improve patient outcomes in several care settings has been previously described [18-21]. Although RDNs may be readily available in tertiary hospital settings, this luxury is not often found in orthopaedic practices. The purpose of this review is to describe the training and efficacy of an RDN and discuss a stepwise plan to incorporating an RDN into an orthopaedic practice, in order to optimize patient care and postoperative outcomes.

What is a Registered Dietitian Nutritionist?

RDNs complete multiple levels of education and training established by the Accreditation Council for Education in Nutrition and Dietetics, including a four-year degree which includes a specially designed and accredited nutrition curriculum, an extensive supervised practice program, and board certification [22]. They demonstrate expertise in helping patients optimize the first line treatment of obesity by assisting patients in creating a feasible plan catered to their individual needs, while providing these patients with the resources, education, and proper guidance to achieve short- and long-term weight loss. In the context of weight loss, behavioral therapy refers to techniques and principles applied to patients with unhealthy weights in order to optimize and assist concurrent diet and physical activity, as well as modify thinking habits that contribute to excessive weight [23]. Behavioral therapy is often used interchangeably with lifestyle modifications and behavioral weight control [24]. Behavioral therapy is considered a cornerstone of obesity treatment and is usually provided by RDNs, psychologists, and exercise specialists, among other health professionals [24,25].

Medical nutrition therapy (MNT) is an evidence-based application of the nutrition care process. The provision of MNT to a patient or client may include one or more of the following: nutrition assessment/reassessment, nutrition diagnosis, nutrition intervention and monitoring, and evaluation that typically results in the prevention, delay, or management of diseases or conditions [26]. MNT provided by RDNs can result in a reduction of up to 10% of presenting weight, as well as long-term maintenance of this reduction [27]. In the short-term, behavioral therapy results in a mean weight loss of 7-10 kg in 6 months sustained for 12 months [23]. Diabetes, hypertension, lipid disorders, and chronic kidney disease improve with MNT [28-34].

Adding an RDN to a clinical practice improves patient outcomes including weight loss. Strong evidence supports the effectiveness of nutrition interventions and counseling provided by a nutrition professional (RDN or equivalent) when part of a health care team. Compelling evidence supports this multidisciplinary team approach to improve weight (1-26 kg), BMI (1-15 kg/m²), waist circumference (1-24 cm), hip circumference (3 cm), fasting blood glucose (2-22 mg/dl), hemoglobin A1c (0.2-6%), fasting insulin (4-8 uIU/ml), homeostatic model assessment-estimated insulin resistance (HOMA-IR; 1-4 units), low density lipoprotein (6-10 mg/dl), and high density lipoprotein (2 mg/dl) in a variety of health conditions (e.g., management of weight, eating disorders, diabetes, renal disease, amyotrophic lateral sclerosis, cardiovascular disease, and osteoporosis) [27].

A randomized control trial compared care by a primary care physician alone with that of a primary care physician along with an RDN and found that over a 12-month period, the group with an RDN lost 3 kg more weight than the physician only group [18]. These results were similar to another study that found that when comparing patients who received weight loss intervention from a family physician alone, patients who received the same intervention with the addition of RDN services had a much larger portion of patients achieving their weight loss goals (57% versus 13%) [35]. Another cohort study found that patients under family medicine care in conjunction with an RDN lost 8 kg over a 3-month period [36]. A larger study involving 42 pediatric practices also found a significant improvement in weight

loss in patients assigned to a physician and RDN group as opposed to a physician only group [22]. Two systematic reviews demonstrate significant improvement in weight loss when behavioral treatment is applied with a team of healthcare professionals including nurses, medical assistants, psychologists and dietitians with physician oversight as opposed to physician counseling alone [37,38].

Overall, RDNs were very helpful in management of patients, and were a valuable source of nutritional and dietary information [19,39]. One physician practice endorsed that having an RDN see and counsel their patients saved them time, although this was not quantified [20]. Another family practice incorporating a dietitian reported that by directly collaborating with an RDN rather than referring out, management of the patient improved due to the physician's established trust with the patient and knowledge of the patient's personality, background, and health status, which improved the effectiveness of the dietitian's interventions [35].

Reimbursement via Registered Dietitian Nutritionist

MNT is linked to improved clinical outcomes and reduced costs related to physician time, medication use, and hospital admissions for people with obesity, diabetes, disorders of lipid metabolism, and other chronic diseases [40].

RDN encounters can occur either in person or via telemedicine allowing practices a technological option as well as enhancing access to care. RDNs have been incorporated in clinical practices of many sizes [18-22]. One randomized trial involving 12 independent research clinics with experience running obesity trials concluded that high frequency telephone contact was similar to high-frequency lifestyle modification counseling in the efficacy for weight loss for patients with an elevated BMI [41]. RDN encounters may be billed for using current procedural terminology (CPT) codes for MNT. Using the RDN as the billing provider, an orthopaedic office will be able to bill for not only an initial assessment but several follow-up encounters (Table 1).

Payment models may differ across practices, including fee-for-service (FFS) and/or alternative payment models (APMs). For example, one clinical practice case was able to fully reimburse their use of an RDN via FFS payments with billing codes including obesity (ICD-9 billing codes 278.0 and 278.01) and overweight (278.02) [21]. Other clinics reported funding the cost of the registered dietitian(s) via administrative overhead, recognizing the value of their services in improving patient outcomes [20]. With the shift to APMs, medical practices are also using Per Member Per Month payments as well as shared savings or other incentive payments to fund RDN services. Practices and institutions participating in Alternative Payment Models, and specifically episode or bundled payments for orthopaedic procedures, can consider building the cost of pre-surgical and post-surgical weight loss interventions provided by the RDN into the cost of care APMs.

A Stepwise Plan for Incorporation

Step 1: Finding and Hiring a Registered Dietitian Nutritionist

The Academy of Nutrition and Dietetics provides a list of RDNs who have completed certificates of training in weight management or earned the board certification in obesity and weight management. Local and state chapters of the Academy of Nutrition and Dietetics are also a good place to advertise for an RDN. Physicians may also visit www.eatright.org to find an RDN.

Step 2: Assessing Patient Need for Weight Loss

The second step is to assess the need for weight loss in patients. This can be accomplished through obtaining an overall health assessment of the patient. This includes pertinent questions regarding diet and exercise habits as well as physical examination findings such as BMI and abdominal girth. This can be done by a medical assistant or physician on initial encounter in order to assess whether the patient will benefit from evaluation by an RDN.

Step 3: Initial Registered Dietitian Nutritionist Visit

After the patient has been determined to be a candidate for evaluation and treatment from an RDN, the patient may be scheduled for an initial encounter with an RDN. Physicians are encouraged to provide a “warm handoff” to the RDN. This way, the patient understands the necessity and benefit of dietitian services, and this may also improve patient follow-through. The initial assessment duration is on average about 60-90 minutes long. This can happen individually, either in person or through telehealth, or even in groups, which may be a cost-effective option.

Step 4: Follow-up Registered Dietitian Nutritionist Visits

The Academy of Nutrition and Dietetics’ evidence-based guidelines form the foundation for the duration and frequency of MNT. Follow up visits may be scheduled as soon as 2 weeks and may occur on a monthly basis as well. Follow-up visits generally last between 30-60 minutes. These may occur over the telephone or any telehealth service. The follow-up appointments may be used to discuss alternative tactics for weight loss if patients are struggling with their

current plan [43]. They may be used postoperatively as well in order to ensure continued weight management while the patient undergoes rehabilitation. For weight loss, patients should be scheduled for at least 14 MNT encounters (either individual or group) over a period of at least six months. For weight maintenance, patients should be scheduled at least monthly for MNT encounters over a period of at least one year [44] (Figure 1).

Incorporation of Registered Dietitian Nutritionist in Clinical Practice

RDNs are beginning to be incorporated into primary care clinics across the world [36-39] to facilitate weight loss (Table 2) [18,20-22]. Some practices have an RDN as part of the clinical staff. The RDN assesses nutritional status and diet as well as recommends dietary and other lifestyle interventions to improve weight loss and healthcare outcomes including improved glycemic control and reduction in cardiovascular risk factors [18-22,35,36,39]. Other practices have RDNs provide patient education regarding diet [20,39]. Educational sessions with RDNs are done either on an individual patient basis or in the form of group classes, which can help maximize time [19]. It is worth mentioning the evidence that suggests that the incorporation of the RDN into the health care team is the preferred approach to the use of an RDN in clinical practice [47]. RDNs improve care coordination, evidence-based care and result in quality improvement [47].

Summary

Obesity is an epidemic affecting over 40% of the United States adult population. Obesity is an independent risk factor for osteoarthritis and has directly resulted in patients undergoing joint replacement at a younger age. A growing body of literature demonstrates that patients

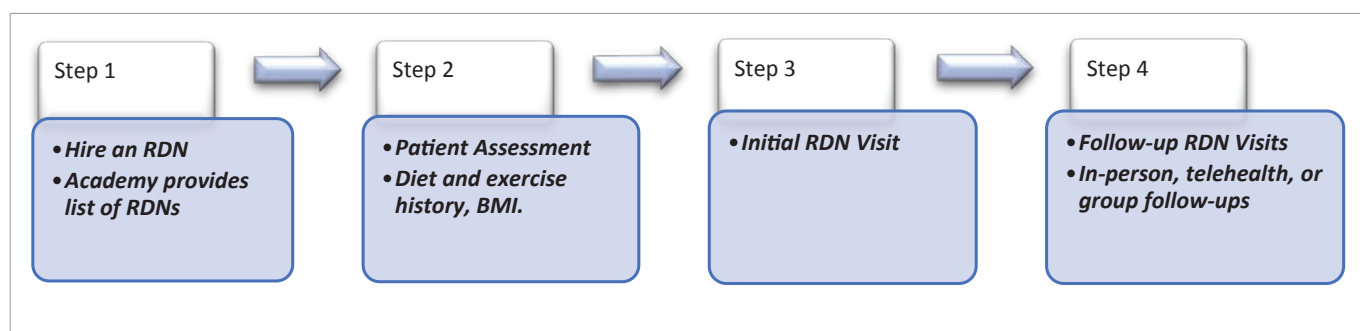


Figure 1: Four steps to incorporating a registered dietitian nutritionist (RDN) into orthopaedic practice. BMI = Body Mass Index.

Table 1: Estimated Revenue and Coding per Encounter.

Nutritional Intervention	Minutes	CPT Codes	RDN Billing Revenue*
Initial assessment	60-90	97802, 4-6 units	\$120.00-\$150.00
Follow-up (2 weeks)	30-60	97803, 2-4 units	\$52.00-\$104.00
Follow-up (4, 6 and 8 weeks)	30	97803, 6 units	\$156.00
Follow-up (monthly)	30	97803, 8 units	\$208.00
Follow-up (Telephone)	10-30	98966-98968	Check with private payers
Follow-up (Online)	NA	98969†	Check with private payers
Group MNT (2-10 people)	30-60	97804, 1-2 units	\$536.00 = \$27.50/hour/patient

*85% of Centers for Medicare and Medicaid Services 2018 physician non-facility fee schedule national payment amount [21]

†In 2020, this CPT code is to be replaced by three new codes [46].

Table 2: Incorporation of Registered Dietitian Nutritionist into Clinical Practice.

Country	Setting	Involvement	RDNs	Outcome	Funding
USA ⁴²	Pediatrics	Weight loss counseling	One	Weight Loss	Research
USA ⁴⁰	Gynecology	Weight loss counseling Patient education Tracking BMI	One	Satisfaction Time Saved	2/3 Billing 1/3 Overhead
USA ⁴¹	Cardiology	Weight loss counseling Patient education	One	Weight Loss	Billing
Canada ³⁸	Family Medicine	Weight loss counseling Patient education	Six	Incorporation Satisfaction	Research
USA ³⁵	Endocrinology	Weight loss counseling Patient education	One	Weight Loss	Research

RDN: Registered Dietitian Nutritionist; USA: United States of America; BMI: Body Mass Index

with increased BMIs are at increased risk for complications following joint replacement. A committee from the American Association of Hip and Knee Surgeons performed a review of the literature regarding obesity and joint replacement, and concluded that for patients with BMIs greater than 40 kg/m², consideration to delay surgery for a trial of weight reduction was warranted [45]. The 2013 task force guidelines from the American College of Cardiology, American Heart Association, and The Obesity Society for the management of overweight and obese adults recommends lifestyle modifications as first line therapy [16]. Lifestyle modifications include modifications in diet, physical activity, and behavioral therapy. RDNs improve patient weight loss when incorporated into a clinical practice [18-22]. Orthopaedic clinics may benefit from the incorporation of an RDN into their practice in order to help patients achieve optimal weight loss prior to surgery and reduce postoperative complication rates.

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