Clin Orthop Relat Res (2021) 479:1-4
DOI 10.1097/CORR.0000000000001624

Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

Not the Last Word

Published online: 29 December 2020

Not the Last Word: Thought for Food

Joseph Bernstein MD

All Americans, to paraphrase the great Irish comedian, Tommy Tiernan [17], belong to one of two categories—those who work out too much and those who weigh too much.

Like most comic observations, this is an exaggeration, but based on truth. For one thing, this classification accurately describes many patients with musculoskeletal complaints.

Although "overuse" and "overweight" are well-represented tropes in orthopaedic clinics, the basic science of their respective pathologies is not represented equally in orthopaedic curricula. Orthopaedic educators are more comfortable talking about collagen and chondrocytes than leptins and lypolysis, evidently. In general, obesity is absent from orthopaedic syllabi, except for the occasional and reproachful mention of its harmful effects.

It is critical that the next generation of orthopaedic surgeons learn about obesity and its treatment. The first reason is plain. Our patients not only present with obesity, but they are also burdened by it [15]. Obesity is a dominant risk factor for back pain [19] and arthritis [21] and is a risk factor for complications from surgical treatments [17, 19]. Thus, treating obesity is an orthopaedic treatment—even if we do not implement the treatments ourselves.

A second reason relates to our somewhat unique role in medical practice. Orthopaedic surgeons are specialists but also provide some frontline care. That is, many of our injured or achy patients do not routinely see a physician. For them, the orthopaedic surgeon treating their knee sprain or shoulder impingement is the only doctor they will see that year. Because of that, we might hear about general medical concerns as well. In my experience, questions about diet and weight loss are the most common.

But there is an even more important reason orthopaedic surgeons should learn about weight loss. Studying the science of obesity, especially its variegated recent history, yields an important lesson in humility, for the dietary dogmas of the just-recent-past have been upended [21].

When I was a medical student in the 1980s, dietary fat was vilified as the main cause of obesity. A corollary was that high levels of dietary cholesterol are responsible for high serum cholesterol. These turned out to be less than completely true. The human liver is more than happy to synthesize fat and cholesterol from a carbohydrate substrate [16].

When I was a medical student, the inarguable claim that an energy imbalance (eating more calories than burned) is present when people gain weight gave rise to weight-loss prescriptions like "Eat Less!" or "Exercise more!" Basically, patients were exhorted to switch their Tommy Tiernan type. This turned out to be bad advice because it neglected why the imbalance was present. Attempts at losing weight by eating less or exercising more will fail when hormones command the body to store fat.

When I was a medical student, Robert Atkins of the eponymous Atkins Diet [3] was denounced in class as a quack. This turned out to be a poor decision by the school, not only because Dr. Atkins was a graduate of my alma mater, and might otherwise have

A *note from the Editor-in-Chief: We are pleased to present to readers of Clinical Orthopaedics and Related Research® the next* Not the Last Word. *The goal of this section is to explore timely and controversial issues that affect how orthopaedic surgery is taught, learned, and practiced. We welcome reader feedback on all of our columns and articles; please send your comments to eic@clinorthop.org.*

The author certifies that neither he, nor any members of his immediate family, have funding or commercial associations (consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted article.
All ICMJE Conflict of Interest Forms for authors and *Clinical Orthopaedics and Related Research®* editors and board members are on file with the publication and can be viewed on request.
The opinions expressed are those of the writer, and do not reflect the opinion or policy of *Clinical Orthopaedics and Related Research®* or The Association of Bone and Joint Surgeons®.

J. Bernstein ✉, University of Pennsylvania, 424 Stemmler Hall, Philadelphia, PA 19104 USA, Email: orthodoc@uphs.upenn.edu

J. Bernstein, Department of Orthopaedic Surgery, University of Pennsylvania, Philadelphia, PA, USA

Wolters Kluwer

made a large donation, but because the Atkins Diet—unlimited bacon and eggs for breakfast, as long as you skip the potatoes and toast, for example—has been shown to improve metabolic markers as well as help people lose weight [18].

In short, learning about obesity promotes intellectual modesty. Yes, some of our treatments are among the most long-standing in medical history. The Hippocratic method of reducing a shoulder dislocation that we still use dates back to, well, Hippocrates. Even our modern surgical procedures have demonstrated endurance. The hips we install in 2020 look very much like the hips Sir John Charnley introduced in the 1960s. This persistence justifiably breeds confidence that we are doing the right thing, but that confidence can spread to areas where it is unwarranted.

An open-minded surgeon who looks at the toppling of diet dogmas in the last few years might retain some healthy skepticism about newfangled concepts such as femoroacetabular impingement [5], viscosupplementation [14], and platelet-rich plasma injections [22].

The science of diet can get a toehold in the already-crowded curriculum if the American Board of Orthopaedic Surgery (ABOS) can be convinced to add some diet-related questions to its tests. Residents will insist that they are taught what they need for their certifying examination [6].

The appeal to ABOS should center on the critical importance of the topic. Still, it would not be a bad idea to point out the benefits to ABOS itself for using questions on diet. If history is any guide, these questions will last a long time without having to be rewritten. The only thing that will need to be updated is the designation of the correct, credited answer.

Joshua "Yoshi" Rothman MD, MS

Pediatric Resident, Children's Hospital of Philadelphia

Founder, Penn Culinary Medicine

Dr. Bernstein's commentary emphasizes the value of nutrition education during medical training to provide more holistic care to our patients. Dr. Bernstein can rest assured that I agree with him on this. (By way of full disclosure, I once had Dr. Bernstein as a preceptor.)

In medical school, I implemented a hands-on nutrition education elective for 4th year medical students. The elective sought to equip soon-to-be doctors with a framework for how to approach nutrition and diet with just about any patient. The goal was not to turn medical students into dietitians, but rather to provide them with the tools to make feasible, impactful dietary suggestions to their patients. We found that medical students who took the course felt more confident in their ability to discuss nutrition with their patients. These students also felt that merely broaching the topic with patients lead to meaningful change [20]. The US Preventive Services Task Force previously came to the same conclusion [9].

But will board exam questions motivate residents to learn about such a complex topic? For example, while the Atkins diet—also known as the ketogenic diet—might yield short-term weight loss, studies lasting longer than a year have not shown a clinically significant difference in weight loss compared to low-fat diets [11]. There is no one-size-fits-all diet, and what works for some might not work for others. In other words, adherence to any diet, not one particular diet, makes the difference [10].

ABOS would be hard pressed to simplify these obesity and weight loss concepts into a couple of board exam questions. The real reason ABOS should include nutrition in its curriculum is because when patients lose weight prior to surgery, they have better outcomes afterward [13]. With the right nutrition education, orthopaedic surgeons may feel empowered to have discussions about diet and weight loss with their patients, or at the very least, refer them to providers with the appropriate clinical expertise. That said, if including nutrition on the boards spurs noon conference discussions, inspires residents to seek the input of dietitians, or ultimately motivates residents to talk to patients about nutrition—that I can get behind.

Jennifer Crowley PhD

Faculty of Medical and Health Sciences

The University of Auckland

I commend Dr. Bernstein for suggesting that the ABOS add diet-related questions to tests for orthopaedic residents and registrars. Diet and nutrition are central to the management of lifestyle-related diseases including obesity, and orthopaedic surgeons, as with all health professionals, should be aware of current approaches to diet and weight loss [7]. Nutrition and behavior change should become a core competency for healthcare professionals who treat patients with (or who are at risk for) nutrition-related chronic disease(s) [2, 8].

In some countries, medical nutrition education aims to provide foundational nutrition knowledge upon which physicians build throughout their medical careers [4], but internationally, medical

Not the Last Word

students report deficits in their nutrition knowledge, skills, and confidence to counsel patients on this topic [7]. Equally concerning is that these deficits continue into medical practice and affect physicians' confidence to implement nutrition care [1, 7]. While the topics taught in medical schools may be informed by curriculum guidelines, the integration of nutrition into the curriculum is at the discretion of individual medical schools. This discretion influences the quantity and quality of nutrition education provided.

Poor nutritional intake and nutrition-related health conditions, such as obesity, cardiovascular disease, and hypertension, are very common in the United States, and these conditions can influence the treatment and care provided by orthopaedic surgeons. All physicians should recognize when to refer a patient to other health professionals, such as a dietitian, for detailed nutrition care. The myriad influences on food choices and eating behaviors, along with conflicting and confusing nutrition messages in the media, make patients' food choices challenging and tend to work against physicians providing nutrition care. Dietitians are skilled in assisting patients to adapt existing diet and lifestyle behaviors to make healthier food choices and lifestyle behaviors within the context of their food environments, cultural practices, and resources that are sustainable in the long-term. The use of restricted-energy "diets" may be justified in the short-term to improve patient safety for impending surgery, but these practices are not sustainable and often not recommended for long-term health benefits [12].

There may be some instances when orthopaedic surgeons cannot or choose not to engage with additional consultants on this topic. In those instances, they still can provide good information to their patients by using this adapted list of key elements for nutrition counseling from Kahan and Manson [12]:

1. **Start the conversation.** An opening question may include, "Can I talk to you about your weight?"
2. **Structure the encounter.** Use methods such as the 5As (assess, advice, agree, assist, arrange) adapted from tobacco counseling. Also use motivational interviewing, a recommended analytical framework, to help patients consider behavioral change.
3. **Focus on small steps.** Making changes to lifelong behaviors may at first seem overwhelming, but suggest incremental small changes such as substituting energy-dense snacks with nutrient-dense foods. For example, substitute a portion of fruit in place of chocolate.
4. **Use available resources.** The Dietary Guidelines for Americans include evidence-based resources that are web-based and are suitable for both orthopaedic surgeons and patients.
5. **Don't do it all at once.** Empowering and supporting patients with behavior change is not a one-off event. Rather, it is an ongoing process.
6. **Do not do it alone.** When possible, use other health professionals for support, such as psychologists and dietitians.

References

1. Adams K, Butsch WS, Kohlmeier M. The state of nutrition education at US medical schools. *Biomed Educ*. 2015;357627.
2. Aspry K, Van Horn L, Carson J, et al. Medical nutrition education, training, and competencies to advance guideline-based diet counseling by physicians: a science advisory from the American Heart Association. *Circulation*. 2018;137:821-841.
3. Atkins RC. *Dr. Atkins' Diet Revolution*. Bantam Books; 1972.
4. Australian Medical Council Ltd. Accreditation of the University of Auckland, Faculty of Medical and Health Sciences. MBChB Programme accreditation report 2015. Available at: Auckland%20accreditation%20report%20(post%20Directors)%2015Aug15.pdf. Accessed November 19, 2020.
5. Bernstein J. The myths of femoroacetabular impingement. *Clin Orthop Relat Res*. 2014;472:3623-3628.
6. Bernstein J, Alonso DR, DiCaprio M, Friedlaender GE, Heckman JD, Ludmerer KM. Curricular reform in musculoskeletal medicine: needs, opportunities, and solutions. *Clin Orthop Relat Res*. 2003;415:302-308.
7. Crowley J, Ball L, Hiddink GJ. Nutrition in medical education: a systematic review. *Lancet Planet Health*. 2019;9:379-389.
8. Frenk J, Chen L, Bhutta Z, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376:1923-1958.
9. Grossman DC, Bibbins-domingo K, Curry SJ, et al. Behavioral counseling to promote a healthful diet and physical activity for cardiovascular disease prevention in adults without cardiovascular risk factors: US preventive services task force recommendation statement. *JAMA*. 2017;318:167-174.
10. Johnston BC, Kanters S, Bandayrel K, et al. Comparison of weight loss among named diet programs in overweight and obese adults: a meta-analysis. *JAMA*. 2014;312:923-933.
11. Joshi S, Ostfeld RJ, Mcmacken M. The ketogenic diet for obesity and diabetes-enthusiasm outpaces evidence. *JAMA Intern Med*. 2019;179:1163-1164.
12. Kahan S, Manson J. 2017 Nutrition counselling in clinical practice. How clinicians can do better? *JAMA*. 2017;318:1101-1102.
13. Keeney BJ, Austin DC, Jevsevar DS. Preoperative weight loss for morbidly obese patients undergoing total knee arthroplasty: determining the necessary amount. *J Bone Joint Surg Am*. 2019;101:1440-1450.
14. Leopold SS. Editorial: Are we all better-than-average drivers, and better-than-average kissers? Outwitting the Kruger-Dunning effect in clinical practice and research. *Clin Orthop Relat Res*. 2019;477:2183-2185.

15. Leopold SS. Editorial: The shortcomings and harms of using hard cutoffs for BMI, hemoglobin A1C, and smoking cessation as conditions for elective orthopaedic surgery. 2019;477:2391-2394.
16. Lustig RH. *Fat Chance: Beating The Odds Against Sugar, Processed Food, Obesity, And Disease*. Penguin; 2013.
17. Malone A, ed. *The Mammoth Book of Irish Humor*. Running Press; 2012.
18. McDonald TJW, Ratchford EV, Henry-Barron BJ, Kossoff EH, Cervenka MC. Impact of the modified Atkins diet on cardiovascular health in adults with epilepsy. *Epilepsy Behav*. 2018;79:82-86
19. Ricciardi BF, Giori NJ, Fehring TK. Clinical Faceoff: Should orthopaedic surgeons have strict BMI cutoffs for performing primary TKA and THA? *Clin Orthop Relat Res*. 2019;477:2629-2634.
20. Rothman JM, Bilici N, Mergler B, et al. A culinary medicine elective for clinically experienced medical students: a pilot study. *J Altern Complement Med*. 2020; 26:636-644.
21. Taubes G. The science of obesity: what do we really know about what makes us fat? An essay by Gary Taubes. *BMJ*. 2013;346 :f1050
22. Zhang YJ, Xu SZ, Gu PC, et al. Is platelet-rich plasma injection effective for chronic achilles tendinopathy? A meta-analysis. *Clin Orthop Relat Res*. 2018;476:1633-1641.