

BARIATRIC MEDICINE

Seven Exciting Developments

Sean Bourke, MD

After fourteen years in emergency medicine, I headed down an uncharted path. Sick of treating the symptoms of overweight and obesity, I wanted to fight the cause. With a buddy from Stanford Residency, Dr. Conrad Lai, I founded JumpstartMD to combat the biggest health care crises of the twenty-first century: adiposity and its evil twin adisopathy, or “sick fat.” Looking back, I had no idea how gratifying this journey would be, and what a positive impact we would have on peoples’ lives.

I was also surprised to see how misguided the information we’d received in medical school had been on this topic, and how many “luminary” thought leaders would emerge from right here in the San Francisco Bay Area to help lead our field out of the darkness of old thinking and flawed science.

In honor of those luminaries and the marvelous journey that has transpired since we founded JumpstartMD seven years ago, these are the seven topics I find most exciting in bariatric medicine right now:

1. The growing recognition that all calories are not created equal

Scientific evidence and the collective knowledge of bariatric clinicians on the frontlines of care paint an increasingly clear picture: Individuals vary greatly in their level of carbohydrate tolerance. Carbohydrate intake that exceeds an individual’s tolerance may cause adiposity, adisopathy, or both. Thus carbohydrates, not fat, may well represent our greatest metabolic and cardiovascular health risk contributing to obesity.

Increased consumption of carbohydrates over the past forty years, both in relative total and as a percentage of all calories consumed, has been *the* major macronutrient change, in lockstep with the rise in obesity and diabetes. Treatment informed by this perspective enables bariatric physicians to tailor diets matched to an individual’s level of carbohydrate sensitivity. It also allows patients to wisely embrace behavioral change in line with optimal, individualized dietary guidance.

That path simply won’t be the carbohydrate-heavy, low-fat food “pyramid” we all learned in school. As humans cannot consume more than 30 to 40 percent of their calories from protein without untoward consequence, the most carbohydrate-sensitive group (such as those with insulin resistance, type 2 diabetes, or metabolic syndrome), in particular, cannot consume a diet that is low in both carbohydrate and fat. For that carbohydrate-intolerant group (and, to varied degrees, the majority of the two-thirds of Americans who are overweight or obese), it is increasingly clear that a well-formulated, low-carbohydrate diet complemented by a good mix

of fats is healthier. Additionally, that mix of fats should focus on consumption of heart-healthy monounsaturated fats such as those in avocados, nuts, and olive and canola oil; temper fears of cardiovascular risk-neutral saturated fats; ensure adequate intake of omega 3s via fish or good-quality supplements; and minimize intake of industrialized oils (like corn and soy oil).

2. The potential use of two new and potentially influential laboratory assays to assess health risk, monitor efficacy of treatment, and educate and motivate individual patients

The first assay mentioned, which I am not yet at liberty to discuss, is currently under development and going through academic validation. It promises to accurately predict individual carbohydrate tolerance at the point of care.

The second, lipid fractionation using Ion Mobility testing (the only assay that directly measures low-density lipoprotein particle size), can more accurately assess metabolic and cardiovascular health risk and pre- and post-weight-loss intervention efficacy of treatment.

Measuring LDL particle size is beneficial because it is carbohydrates, particularly white flours and sugars (again, not fat), that shape LDL particles into the various medium, small, and very small sizes that disproportionately drive cardiovascular risk. Further, smaller LDL particles flag an early proclivity to metabolic syndrome even prior to actual rises in insulin. Because carbohydrate restriction and weight loss are the principle treatments for metabolic syndrome patients, lipid fractionation can help tailor diets for insulin-resistant higher-risk patients. Additionally, measuring lipid fractionation particles pre- and post-weight loss intervention in those patients represents new value in terms of helping patients understand why their macronutrient composition matters, and to further motivate optimal dietary compliance.

3. The recent discovery at the Gladstone Institute that the ketone body Beta-hydroxybutyrate served to potently reduce oxidative stress (see “Suppression of Oxidative Stress by Beta-Hydroxybutyrate, an Endogenous Histone Deacetylase Inhibitor” by Shimazu et al)

Ketogenic diets have traditionally been maligned by the medical community, largely through a misunderstanding of the differences between the pathologic state of diabetic ketoacidosis (ketone levels 15–25) and the benign state of nutritional ketosis (ketone levels 0.5–5). While further studies are needed, the findings in this study suggest an underlying epigenetic mechanism through which ketogenic diets may serve

to prevent oxidative stress and cellular free-radical formation and, thus, might actually slow aging and prevent a variety of diseases, from coronary artery disease to Alzheimer's and beyond.

4. *The Vivus Corporation's recent FDA approval for an anorectic medication composed partly of phentermine for long-term use*

Let me clarify: I do not believe that Qsymia, the extended-release topiramate-phentermine combination, offers therapeutic benefit proportionate to its cost in comparison with cheaper, older generic anorectics. However, Vivus's management of the studies needed to assure the FDA that this phentermine extended-release topiramate combination is safe and effective to administer long-term is a positive development.

Bariatrician survey data suggests that the vast majority have been using Schedule III and Schedule IV anorectics off-label safely and effectively long-term for years—but under a chronic and low-level fear of harassment by the Drug Enforcement Administration. Since FDA concerns were not evidence-based, this peeling back of the proverbial onion can only be helpful in further confirmation of their invalidity. The approval of Qsymia for long-term treatment and further studies in progress may therefore pave the way for FDA reevaluation of its regulatory stance around long-standing, safe, and effective use of generic anorectics such as phentermine, phendimetrazine, and diethylpropion.

Also noteworthy on the medication front: The selective serotonin 2c receptor agonist lorcaserin (Belviq) and a combination bupropion SR and naltrexone SR are both pending FDA approval on the year 2014 horizon.

5. *Recognition that, for the vast majority of patients, exercise is a lousy weight-loss tool*

I know this sounds heretical, but the truth will set us all free. While a great wellness tool—think cardiovascular, metabolic, mental, and musculoskeletal health—and an important component of weight *maintenance*, the ill-founded belief that exercise produces weight loss has led too many down a (sweaty and demotivating) garden path. Living in our “toxic environment” (per Yale Professor Kelly Brownell)—rife with ubiquitous and cheap carbohydrate rich foods—you cannot outrun your mouth. Effectively busting that exercise myth is essential.

Why? Because patients need a clear and transparent understanding of what *really* works to achieve and sustain a healthy weight that's based on science, not catchy marketing or popular magazine advice. The food industry has a great stake in convincing us that our sedentary lifestyles and lack of exercise, rather than the adulterated food supply they're selling us, is the cause of the obesity epidemic; but I'll quote the “consensus statement” from the American Heart Association and the American College of Sports Medicine on this subject: *“It is reasonable to assume that persons with relatively high daily energy expenditures would be less likely to gain weight over time, compared with those who have low energy expenditures. So far, data to support this hypothesis are not particularly compelling.”*

Exercise as a “not particularly compelling” weight-management tool bears out our experience at JumpstartMD with more than 10,000 patients. This should not discourage exercise or the pursuit of improved fitness, but rather spur patients to focus on nutrition first to lose excess weight, and then integrate exercise to promote health and positive body composition changes and to foster long-term success as a complement to weight-loss maintenance.

6. *Everyone eats food: The visions of Alice Waters and Michael Pollan*

Alice Waters, the matriarch of the Bay Area good food movement, has become queen not of haute cuisine but, to use her own words, “simple foods”—foods sourced locally and grown sustainably. She is also founder of the Edible Schoolyard Project and Chez Panisse Foundation, and she has led many back to the pleasures of their kitchens by way of their gardens. Fellow Berkeley resident Michael Pollan has given us embraceable, actionable, pithy phrases everyone can rally around, such as “Eat foods. Not too much. Mostly plants.” “Don't eat anything your great-grandmother wouldn't recognize as food.” “Shop the peripheries of the supermarket and stay out of the middle.” His next book on the importance of cooking is due out shortly.

Along with doctors like Steve Phinney, Ronald Krauss, and Robert Lustig, leading food and nutrition thinkers like Pollan, Waters, and Gary Taubes are creating a dialogue around the new science that makes one thing clear: Nutrition is the linchpin on which the solution to the obesity crisis must turn. I am grateful for their leadership, the tangible impact this new thinking has had on the Bay Area food movement and on the health of my patients, and the longer-term impact it will have in the evolution of my field.

7. *Building the future*

Yes, everyone eats food; yet our modern food supply barely resembles food any longer. We're sold “toxic” nutritional time bombs in pretty, easy-to-consume packaging served up fast, cheap, and everywhere you look. At a recent lecture given by Dr. Robert Lustig, he said that 80 percent of the 600,000 foods listed in our food supply have added sugar. Average American consumption of sugar has increased from 5 pounds per capita in the eighteenth century to 35 pounds in the nineteenth century to 156 pounds today. Ouch.

The problem is arguably complex, but the solution is simple: real food. It does not lie in the substitution of one toxic product for another, such as liquid “shakes”; chemically preserved “meals”; or pointless point systems that allow Twinkies, tuna, and taffy interchangeably. All calories are *not* created equal.

At JumpstartMD, our practices hinges on this belief. Our clinical outcomes have been proven up to three to four times more effective than traditional offerings, and more than 80 percent of our maintenance patients remain within one pound of their losses because we help them learn healthy habits tailored to their needs and built upon a foundation of whole, fresh, real food meal strategies that are meant to last a lifetime.

Continued on the following page . . .

Bariatric Medicine

Continued from the previous page...

Moving toward “the” solution to this daunting problem is by necessity a collective process that—like our practice at JumpstartMD—will employ a comprehensive approach that’s informed by the seven elements outlined in this piece, and those yet to come. It is this collaborative passion and perpetual search for improvement that I find one of the most exciting elements of bariatric medicine today.

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Neurology

Continued from page 25...

deeper brain electrodes for extended-duration monitoring. If the focus of seizure generation can be identified, then surgical removal of the focus is considered.⁹ This requires a careful assessment of the risks of tissue removal in terms of affecting memory or other eloquent functions. Such determinations are made after careful assessment by the neuropsychologist. In the setting of refractory epilepsy, where a structural brain lesion cannot be identified or safely resected, the placement of a vagal nerve stimulator may reduce seizure frequency with an acceptable safety profile.¹⁰

Within neurosurgery, there have been exciting developments. Among the most exciting are the newer sites within the brain where stereotactic electrodes can be placed to treat movement disorders such as Parkinson’s disease¹¹ and essential tremor, obsessive compulsive disorder, and severe depression that is refractory to conventional treatments.¹² Current research is directed at identifying additional sites where stimulation may influence other complex behavioral disorders. Similarly, stimulation of the spinal cord with epidural electrodes connected to an impulse generator can reduce both neuropathic and somatic pain disorders that prove to be refractory to conventional measures, such as failed-back syndrome and post-spinal cord injury pain syndromes.

The treatment of brain tumors has advanced in many ways—from the understanding of genetic, hormonal, and environmental mechanisms to the safety and efficacy of tumor treatments. For gliomas primary to the brain, the maximal safe excision of the tumor improves survival,¹³ on occasion using complex brain mapping techniques in an awake individual.¹⁴ For benign tumors such as meningiomas and vestibular schwannomas, surgical excision is now sometimes limited to less-than-complete removal to enhance safety, knowing that added techniques, such as stereotactic radiosurgery, can control the residual tumor for years to come.¹⁵ Pituitary tumors,

if they produce prolactin, can often be controlled with drug therapy. If they are non-hormone secreting, such tumors are now treated with combined neurosurgical and ENT endoscopic techniques that provide a panoramic view, and added safety for the patient.¹⁶

Spine surgery is currently undergoing a critical reevaluation of the historic technique of spinal fusion, recognizing that many patients can undergo minimally invasive decompressive surgery while avoiding the morbidity of fusion altogether.¹⁷ In those that need correction of instability or spinal alignment, the methods of fusion are gradually becoming less invasive and morbid.¹⁸ Much more controversial is the use of artificial discs, which may play some role in the treatment of cervical spine disease; however, they remain extremely controversial in the treatment of low back pain.¹⁹ Neurosurgeons now recognize that among the most important aspects of our care is the cost-effectiveness of our diagnostic treatment and surgical interventions. More and more spine research focuses on or includes quality-of-life data.

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