

Family Doctor

A Journal of the New York State Academy of Family Physicians



Summer 2026

Volume fifteen, Number one

Focus:

Obesity Medicine



FEATURE ARTICLES:

- What Patients Are Seeing: A Primary Care Guide to Compounded GLP-1s, Telehealth Prescribing, and “Natural” Peptide Marketing
- The Baggage of Bias: Examining Weight Bias Internalization in our Patients
- Preserving Muscle Mass in the Era of Modern Pharmacotherapy: A Sports and Obesity Medicine Perspective
- “Obese or Rubenesque?” Optimizing Clinical Observation and Public Health Perspective through the Medical Humanities
- The Silent Contributor: A Review of Prescription Medications Associated with Iatrogenic Weight Gain

Family Doctor: A Journal of the New York State Academy of Family Physicians is published quarterly. It is an online only journal and members are eligible for CME credit through the AAFP.

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A Note to our Readers:

Obesity, eating disorders, and mental health are not mutually exclusive. As we present this edition on obesity medicine, we want readers to recognize the close and often complex relationship among these conditions.

People living with obesity experience higher rates of depression, anxiety, binge-eating disorder, emotional eating, body-image dissatisfaction, weight stigma, and shame. This relationship is often bidirectional. Depression and anxiety may contribute to weight gain through stress-related eating, disrupted sleep, and reduced physical activity, while obesity may negatively affect mental health through stigma, discrimination, chronic pain, and medical complications. Childhood trauma, abuse, and other adverse experiences have also been associated with obesity and eating disorders later in life.

Social media has transformed GLP-1 medications into a cultural phenomenon. Patients are regularly exposed to dramatic before-and-after photographs, celebrity weight-loss stories, advertisements, comparisons, and unrealistic expectations about how quickly weight loss should occur.

Some patients feel empowered and hopeful, while others become discouraged when their results do not match those promoted by influencers on social media. These messages may also reinforce the harmful belief that thinness automatically equates to health, beauty, or happiness, potentially worsening body-image concerns and disordered eating behaviors.

There is no question that GLP-1 medications have revolutionized obesity treatment. Many patients report reduced “food noise,” fewer obsessive thoughts about eating, improved mobility, greater confidence, and a better quality of life. For those who once felt trapped in a downward spiral or believed surgery was their only option, these medications have provided hope and an opportunity to regain control of their health.

At the same time, significant weight loss may bring longstanding emotional struggles to the surface. Patients who previously relied on food to cope with stress, trauma, loneliness, or grief may struggle when that familiar coping mechanism is no longer available.

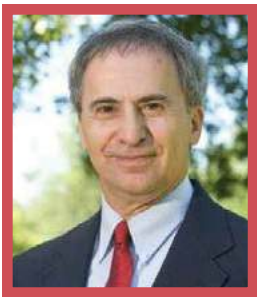
This raises an important question: **When we quiet biological hunger, what happens to the emotional hunger that may remain?**

For some patients, the answer is liberation. For others, weight loss may uncover depression, anxiety, trauma, grief, body-image distress, or eating-disorder behaviors that had previously been masked by food-related coping.

This is why obesity medicine cannot be practiced in isolation. It lies at the intersection of metabolic health, behavioral health, eating-disorder care, and the societal messages surrounding body weight. Effective treatment requires more than prescribing medication and monitoring the scale. It calls for open conversations, realistic expectations, and collaboration among primary care physicians, obesity specialists, mental health professionals, dietitians, and eating-disorder experts.

As we recognize the remarkable progress made possible by modern therapies—and the promising treatments on the horizon—we must remain attentive to the whole person. Obesity is a chronic, multifactorial disease, and meaningful care extends beyond weight loss alone. Our responsibility is to help patients improve their physical and mental health while developing a healthier relationship with food and their bodies.

*Ani A. Bodoutchian, MD, MBA, Dip ABFM, Dip ABOM, FAAFP, CPE
Editorial Board Member, Family Doctor*



From the Executive Vice President

By Vito Grasso, MPA, CAE

Membership in the Academy has declined in recent years. This development presents a major challenge to AAFP and its chapters.

During the first two decades of my 32-year tenure as NYSAFP EVP, we enjoyed steady growth in membership, particularly among student and resident members. The latter was caused by growth in the number of family medicine residency programs in NY. We also experienced more modest but still consistent growth in active membership.

The most significant change in the medical profession in the past 30 years has been the gradual transition from private independent practice to employment. That has impacted the profession in a variety of ways, including the decline in physician membership in medical societies. We have struggled to understand the dynamic which occurs when members are employees rather than independent in their own practice. Part of our challenge is to demonstrate value of Academy membership to the employer.

There has also been a decline in student participation in medical societies, with primary care organizations experiencing more dramatic erosion of student membership than subspecialty organizations. Much speculation suggests that students are increasingly gravitating toward higher income specialties. When viewed in the context of the transition from independent practice to employment and the significant increase in student debt, this trend may suggest that students see subspecialty practice as more likely to generate the security and income necessary to pay off educational debt and enjoy more manageable hours.

We are also confronted with a serious change in public perception of the profession. Recent surveys have found that trust in physicians has declined since the COVID pandemic. An article in the 8/7/24 online edition of Northeastern Global News reported that a national survey found a decline in public trust of physicians from 71.5% in April 2020 to 40.1% in January 2024. [Northeastern Global News](#).

This decline in public trust of physicians may also be reinforced by the anti-science, anti-intellectual posture of the current administration.

As we endeavor to maintain and demonstrate the value of membership in the Academy, we are focused on continuing our advocacy for family physicians and their patients, maintaining the highest quality of educational programs to help members continue their professional development, and disseminating information to alert members to developments which impact upon them, the medical profession and their patients. These are core areas of activity that have historically been prioritized by members. Continuing to perform well in these fundamental areas is essential in demonstrating value.

The challenge going forward is to define a relationship with employed physicians which can materially help them in reaching personal and professional goals while functioning outside the traditional norms of private independent practice. A survey by the Physicians Advocacy Institute (PAI) offers insight into how this dynamic has changed practice for employed physicians. Key findings of the survey of 1,000 employed physicians:

The most significant change in the medical profession in the past 30 years has been the gradual transition from private independent practice to employment

“Over half of employed physicians reported that changes in practice ownership reduced the quality of patient care, citing an erosion in clinical autonomy and a greater focus on financial incentives. Almost half of physicians reported a deterioration in relationships with patients, seen mainly in decreased visit time and communication. For physicians who shifted from independent medical practices, various factors including government and private insurer payment cuts, drove their decisions.” <https://www.physiciansadvocacyinstitute.org/PAI-Research/Employed-Physician-Survey>

Among the specific findings of the PAI survey:

- Independent practices are typically associated with greater clinical autonomy, personalized patient relationships, and a focus on individual patient needs.
- Employed physicians have less autonomy in clinical decision-making, with 61% having moderate or low autonomy for referrals and 70% seeing employer incentives that affect patient volume.
- Employed physicians experience worsened patient relationships due to shorter visit times, less communication, and lower priority of patient preferences.

Medical societies have historically operated to standardize medical practice and education, create ethical standards for the profession and afford an environment for collaboration, information exchange and mentorship among physicians. Additionally, medical societies have evolved to include advocacy

for public health, research and recognition of excellence in practice. Businesses which employ physicians may not share these objectives. Sustaining the qualities which make medicine a profession is less important to employers than meeting bottom line goals of the company.

The dilemma for medical organizations is that continuing to operate as professional societies focused on the ethics, practice standards and continuing professional development of physicians is unlikely to demonstrate value to employers who see physicians as tools in producing services. Increasingly, particularly regarding primary care, employers also see those tools as replaceable by lower cost and less capable non-physician clinicians. It is time for the profession to recognize that changes in health care, particularly the corporatization of health care providers, is a material threat to the relationship between physicians and their patients.

If the effectiveness of physicians as patient advocates continues to erode, then the standing and role of physicians in health care will also continue to decline and membership in medical societies will become a moot issue as employers move on to cheaper and more compliant providers. Helpless patients have no recourse. Medical societies need to be empowered to restore professionalism to medicine by representing their members in defining the terms and conditions of patient care with employers and with health insurance plans.

Upcoming Events

2026

Summer Cluster in Penn Yan at Keuka College
August 8-9

Resident Meet & Greets
Oct 6 Capital District - Trilogy Hotel
Oct 7 Long Island - Blackstone Restaurant
Oct 14 Syracuse
Oct 15 Erie/Buffalo

Regional Family Medicine Conference at NYU Langone
Oct 10

**Board Meeting - Virtual;
Commissions meet virtually prior**
Nov. 1

2027

Winter Weekend in Lake Placid
Jan 15-17

Winter Cluster
Feb 21

Advocacy Day
Feb 22



President's Post

By Wayne Strouse, MD, FFAFP

The topic of this summer's Family Doctor, obesity, is certainly, well, "topical." After many years of offering little more than "eat right and exercise more," or amphetamines, we now have a number of medications approved to treat obesity. For most of our patients, the GLP-1 class of drugs is both tolerable and effective. They are, unfortunately, ridiculously expensive (OMG! \$1300 a month!), although many of the pharmaceutical companies are offering "deep discounts," which make them "affordable." All of these are, of course, relative terms. Many people can't come up with the money for a \$400 emergency, let alone a monthly "affordable" cost of \$250, \$350, or \$500. Consider that in Denmark (home of Novo Nordisk, maker of Ozempic and Wegovy), the cost is \$125-\$130 per month for Ozempic, or \$200 to \$300 a month for Wegovy. I assume they are not losing money at those prices, and we once again see one of the reasons why our healthcare costs are double those of every other country. (You knew I would slide in something about single payer somewhere.)

Of course, the costs of untreated obesity are mind numbing as well. Obesity has surpassed smoking as the number one cause of preventable illness. The better we can treat it and prevent its morbidities; the better our patient's health will be in the future.

My other concern regarding the treatment of obesity is the propensity for entrepreneurial websites to spring up and take advantage of this. Hims, ro, Remedy Meds, Noom, and hers websites offer online prescriptions for obesity (and a number of other maladies, from hair loss to impotence to managing menopause and mental health). They clearly are not looking at the whole patient, but dividing people into one or two specific problems, with the option to "tell us what is wrong, and tell us what you want, and we will prescribe it for you." There is not much of a relationship, and perhaps that is considered a benefit. At a time when you can order up dinner, groceries, and health and beauty items without interacting with a person, why can't you just order up prescription medications the same way?

So, we need to remember our roots. Family medicine is about the whole person AND about the relationship, the doctor—patient relationship. We offer a unique service, one that is not bought and sold like a box of cereal. Yes, we can treat obesity, but in a wholistic manner because we see our patients as whole people.

Wayne Strouse, MD is currently the NYSAFP President. He has had an eclectic career, serving as a Navy family physician, as faculty at a rural residency (University of Rochester), as a general practitioner for a year in New Zealand, and for the past 25 years, as a solo, rural family medicine doctor in Penn Yan, NY in the Finger Lakes region of Upstate NY. He is now semi-retired, seeing his patients 2 half-days a week to allow more time for his presidential duties.

Dr. Strouse has a broad spectrum of professional interests, from psychiatry, to smoking cessation, dermatology, the prevention of burnout, DPC practice, and of course, rural healthcare, and does office procedures including circumcisions, joint injections, and skin biopsies. He is a strong advocate for a single-payer healthcare system.

Obesity has surpassed smoking as the number one cause of preventable illness. The better we can treat it and prevent its morbidities; the better our patient's health will be in the future.

Albany Report

By Reid, McNally & Savage
June 15, 2026

The regularly scheduled 2026 legislative session in New York concluded with the Senate adjourning Friday, June 5th early in the morning while the Assembly worked through the night, gaveling out just after 8pm. In total, nearly 800 individual bills were passed by both houses this session out of approximately 19,000 bills introduced during the 2025-26 legislative term (the period during which a bill can remain active). Passed bills will now need to be transmitted to Governor Hochul's desk before the end of the year for her to sign, veto or seek chapter amendments for.

Many issues dominated state discussions this session including redistricting amendments, postponement of NYC class size mandates, local election shifts to even years, artificial intelligence and data center regulation, and others. Unfortunately, due to final state budget negotiation delays as several contentious issues were brought to the table including climate policy changes, taxes, pension reforms, immigration, and more, legislators had a very limited window to focus on legislation.

Lawmakers have now returned to their districts with many facing primary challenges on June 23rd, and the upcoming general elections November 3rd this year. There are many lawmakers not running for reelection including Senate Deputy Majority Leader Mike Gianaris (D-Queens) and Assembly Majority Leader Crystal Peoples-Stokes (D-Buffalo). Absent a call for a "special session," legislators won't return to Albany again until January 2027 when the next session begins.

Following is a summary of positive outcomes for the SFY 2027 Final State Budget and NYSAFP's advocacy efforts on priority bills on behalf of its members and the patients family physicians serve:

Final State Budget Achievements

- Physician Assistant Scope of Practice Expansion Rejected
- Prior Authorization Reforms Including:
 - Require formularies to be posted publicly via a standard, accessible format;
 - Ensure prior authorizations for designated chronic conditions remain valid longer;
 - Expand continuity of care from 60 days for life-threatening conditions or late-stage pregnancy to 90 days for all health conditions and the full postpartum period; and
 - Expand the data health insurers must report on their claims processes
- \$15.865 million in full funding for Doctors Across NY
- \$2.7 million in funding for Area Health Education Centers (AHEC); An additional \$500,000 from previous years
- Physician Excess Medical Malpractice Program Restructuring rejected and program extended through June 30, 2027
- Transfer of oversight from State Education Department to Health Department rejected
- Abortion Access and Reproductive Healthcare Infrastructure funding:
 - \$25 million for the Reproductive Freedom and Equity Grant program to expand capacity and ensure access for patients
 - \$1 million for additional services and expenses for state for abortion access and available for payment to support grants for access to essential care

continued on page 8

- \$20 million for services and expenses for abortion service providers, including costs associated with medication abortion care
- \$5 million for additional services and expenses for abortion service providers, including costs associated with medication abortion care and available for payment to support grants for access to essential care
- \$10 million for capital projects at reproductive health facilities, including support for infrastructure improvements, modernization, and safety and security
- Strengthened oversight by DOH of rejected healthcare transactions
- Extension of New York's Tobacco Tax to alternative nicotine products such as nicotine pouches
- Authorization of any eligible health care provider to provide medical care to an injured worker
- Permanent carve out of school-based health centers from Medicaid Managed Care

Pieces of Legislation to Protect Vaccine Access in NYS Passed Both Houses, Some Enacted

Given federal policy shifts over the last year and a half, various efforts have been made by Governor Hochul, agencies, and lawmakers to protect vaccine access for New Yorkers. NYSAFP and RMS continue to lead a vaccine coalition in New York (Let's Get Immunized NY) and have been dedicated to supporting these initiatives, including several sign on letters, joint memos, and a month of immunization action in May, in which we provided partners with talking points for a phone call campaign, a social media toolkit, and letters to be sent to lawmakers related to several key bills.

The effort mentioned above was focused on the Senate as we were glad to see the Assembly pass a [package of legislation](#) focused on vaccines in late April. Ultimately, bills passed by both houses include the following:

- **Support for Providers** (A.9140, Rosenthal/S.9604, Hinchey)
 - Extends liability protections for clinicians administering vaccines in accordance with state guidance enabling family physicians to continue delivering care grounded in science without unnecessary legal risk; and
- **Strengthened Immunization Requirements** (A.3254, Dinowitz/S.3958-A, Skoufis) – Requires all children attending children's camps to have received all required school-age childhood immunizations to attend, and individuals working at the camp be up to date on vaccinations

And we are happy to share that the Governor already signed two bills into law that 1) require health insurers cover vaccines recommended by the NYS Commissioner of Health in addition to the vaccines recommended by ACIP, (S9599/ A10710) and 2) remove references to ACIP from state public health, education, and social services laws and authorize pharmacists to administer the COVID-19 immunization to children ages two to 18 under State law (S9598/ A10711). For both of these measures, the State Department of Health will rely on the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), and the American College of Obstetricians and Gynecologists (ACOG) vaccine schedules.

Primary Care Investment Act Passed by State Senate and Moved to the Assembly Ways & Means Committee

A main priority of NYSAFP's for several years now, Academy leaders and RMS worked throughout the budget period and entire session to get the measure either included in the final state budget or passed by both houses as standalone legislation. In late May, the Senate passed the bill and following this in close coordination with the Primary Care Coalition, we conducted outreach to members of the Assembly Ways and Means Committee urging them to move it to a vote. While they ultimately did not advance it, we thank all the Academy members who responded to the Action Alert we put together and sent letters to their Assemblymember asking that they follow the Senate's leadership and pass the bill!

Looking to next year to continue this momentum, RMS spoke directly with Assemblymember Amy Paulin's legislative director in the final days of session and learned that there were some concerns from the Greater New York Hospital Association that Assembly leadership would like to address. We look forward to engaging closely with the bill sponsors and other stakeholders to refine the language to ensure the legislation is both effective and workable in practice without altering its fundamental objective.

"Wrongful Death", Physician Assistant Independent Practice, and Other Bills Defeated

Vetoed four times now by Governor Hochul, we are happy to report that wrongful death legislation, which still authorizes an award in a wrongful death action to include compensation for grief or anguish, the loss of services, support, and inheritance, and the loss of nurture and guidance, was held in both the Senate and Assembly Judiciary Committees.

Additionally, several bills were again introduced this session that would eliminate supervision requirements for physician assistants (PAs). A.7988, Paulin/ S.7981, Rivera, would have eliminated supervision requirements for PAs with 6,000 practice hours and those practicing in primary care or hospital settings. A.5130, Solages, would have broadly authorized PAs with 3,600 practice hours to practice without supervision.

Despite Advocacy Day being cancelled and efforts turned virtual, over 50 Academy members sent messages to their legislators urging opposition of the related budget proposal, as well as the above-mentioned bills in March. We also were pleased that a [Letter-to-the-Editor](#) authored by Dr. Jose David, NYSAFP Past-President, stressing the importance of physician-led care was published by the Times Union on May 11th. Ultimately, these concerns were clearly heard as these bills were held in both the Senate and Assembly Higher Education Committees this year.

RMS and NYSAFP leaders also carefully monitored and weighed in on several bills that while commendable in intent, as currently written would be problematic or burdensome administratively or cost-wise for physicians. As indicated below, these were all rejected though we will keep a close watch as any bills that did not pass both houses this year and have to be reintroduced in the 2027 legislative session:

- Permanent elimination of written agreement and collaboration requirements between NPs and physicians (A1220, Paulin/ S2360, Rivera) *Status: Held in both Senate & Assembly Higher Education Committees*
- Required discussion by physicians with patients regarding risks associated with any opioid drug and opioid analgesics (A.9010-B, Rosenthal/ S.6758-B, Fernandez) *Status: Passed Senate, Held in Assembly Health Committee*
- Rescue Inhaler Prescription Reporting in NYSIIS for Children (A5194-B, Reyes/ S3964-A, Rivera) *Status: Held in Senate Rules Committee & Assembly Health Committee*
- Required Segmentation and Suppression of Sensitive Health Information by EHR Companies (A.2613-A, Lunsford/ S.1633-B, Fernandez) *Status: Passed Senate, Held on Assembly Floor*



State Senator Michelle Hinchey and DOH's Dr. Ariela Zamcheck Attended COD in May

On Saturday, May 16th, NYS Senator Hinchey, representing counties in the Hudson Valley and Catskills, and Dr. Zamcheck, Bureau Director of Vaccine Preventable Diseases within the Division of Vaccine Excellence at the NYSDOH, joined Dr. Jamie Loehr, practicing family physician and former ACIP member, to address attendees at NYSAFP's annual Congress of Delegates. To kick off this roundtable discussion, Dr. Loehr provided an in-depth review of ACIP before it was weakened and gave updates on major events affecting it since then, as well as the lawsuit against Secretary Kennedy. Dr. Zamcheck then shared NYS approaches to ensure vaccine availability and clear messaging, in addition to vaccine confidence strategies that can be utilized by physicians and clinics. To round it out, Senator Hinchey shared details on her immunization policy leadership and more broadly, the work she is doing to support New Yorkers' access to healthcare and food especially in rural areas. She also emphasized the importance of Academy members being engaged in local, state, and federal politics and shared her gratitude for all that physicians do in their communities.

Legislation of Interest Passed by Both Houses

Please review the summaries below of bills that passed both the Senate and Assembly this session of particular interest to NYSAFP. These pieces of legislation will now need to be transmitted to Governor Hochul's desk before the end of the year for her to sign into law, veto, or seek chapter amendments for. We

also shared our comprehensive Health/Mental Hygiene summary of bills spanning several sectors such as hospitals/institutional care, health professions, public health, insurance, and more that passed both houses this session, also linked [here](#).

Prohibit Storage of Credit Card Information Without Consent (S2393, Persaud/ A8460, Cunningham)

Prohibits hospitals and health care providers from storing credit card information without signed written consent and requires disclosure if such information could be used to pay balances.

Protection of Health Information (S9269, Krueger/ A10357, Rosenthal)

Would bar companies from collecting, using, or sharing consumers' private health information unless they obtain authorization from the individual or qualify for one of the law's exceptions. Consumers would also have the right to revoke that authorization, requiring companies to stop accessing their health information and, in many cases, delete it. The bill contains amendments from the version vetoed by Governor Hochul last year including eliminating the 24-hour waiting period before companies can seek authorization to process patients' data and expanding exemptions for certain categories of information and entities already subject to other privacy laws and clarifying procedures for verifying consumers' identities.

Interoperability of Prescription Drug Monitoring Program (A8849-B, McDonald/ S9401-A, Rivera)

This legislation would require the Department of Health to facilitate the exchange of data between the state Prescription Drug Monitoring Program and electronic health records and enable interoperability.

Rare Disease Advisory Council (S1287-B, Persaud/ A1296-B, Paulin)

Establishes the Rare Disease Advisory Council to identify best practices, raise awareness regarding rare diseases, evaluate barriers to access to care, and to make recommendations to the legislature and the governor. The Council will consist of at least 17 members, including DOH and DFS Commissioners, nine members appointed by the governor and two members each appointed by the Senate and Assembly.

Integrated Behavioral Health Services (A329-C, Jackson/ S3051-B, Harckham)

This legislation includes the following:

- Defines integrated behavioral health services as "the systematic coordination of evidence-based healthcare services, to include the preventative, diagnostic, therapeutic and rehabilitative care and treatment of mental illness, addiction and the provision of physical health services, otherwise provided by a mental health program licensed pursuant to article 31 of mental hygiene law, or addiction disorder services provided by a provider certified pursuant to article 32 of mental hygiene law to any individual, including children and youth, seeking services regardless of their primary diagnosis. Provides that the scope of such services may be restricted pursuant to regulation."

- Authorizes the commissioners of the Office of Mental Health (OMH) and the Office of Addiction Services and Supports (OASAS) to jointly establish a single license and set of regulations, standards, and requirements for the construction, operation, reporting, and oversight of integrated behavioral health services.
- Places programs licensed to provide integrated behavioral health services under the jurisdiction of the Justice Center and require the commissioners of OMH and OASAS in consultation with the Justice Center to promulgate regulations.

Relates to Medication Abortion Drugs (S8544, Hinchey/ A9217, Paulin)

This legislation provides that brand name or generic mifepristone or any drug used for medication abortion shall not be deemed an adulterated or misbranded drug solely because it is no longer approved by the FDA provided that: its labeling was true and accurate at the time of manufacture; and the drug is recommended for the purpose for which it was prescribed under World Health Organization guidelines that are current at the time of prescribing or dispensing.

New York Dignity in Pregnancy and Childbirth Act (S6983-A, Brisport/ A4018-A, Forrest)

Amends the public health law to require that all clinical staff providing perinatal care in hospitals and other facilities must complete on an annual basis an evidence-based implicit bias training program approved by the Department of Health. The bill also provides that the Department will track and publish, at least once every three years, data on severe maternal morbidity and aggregate such by region, racial and ethnic identity.

Conforming Changes to Nurse Practitioner Scope of Practice (S3822, Rivera/ A1942, Paulin)

Conforms various sections of law with regard to clarify that NPs may sign certificates enabling students to enter and return to school, complete examinations for proof of physical fitness, sign certificates of disability under the vehicle and traffic law, provide bus driver health certificates, and provide juror excusal notes for breastfeeding parents.

Food Security Trends Reporting (S8553-A, Hinchey/ A9168-A, Woerner)

Amends the public health law to require the Department of Health to include the 2024 U.S. Household Food Security Survey Module: Six-Item Short Economic Research Service as part of its annual participation in the Behavioral Risk Factor Surveillance System and to annually report the findings, broken down to the county level, of the survey module on the Department's website.

Expanded Tick-Borne Disease Reporting (S10340, May/ A11328, Schiavoni)

Amends the public health law to require the Department of Health to promulgate regulations to establish alpha-gal syndrome, caused by the bite of a lone star tick, as a reportable disease. Also mandates that the Department extend the list of tick-borne diseases included within the tick-borne disease surveillance report to include alpha-gal syndrome.

Cesarean Births Review Board (S7544-B, Brouk/ A1541-B, Paulin)

Amends the public health law to establish the cesarean births review board consisting of two licensed midwives, two licensed

registered nurses specializing in obstetrics, two licensed physicians specializing in obstetrics and gynecology (all registered in the state), and two representatives of a women's maternal health organization that operates in NYS, as well as additional members appointed by state leaders. The board would be mandated to undertake a review of cesarean births at hospitals in NYS and subsequently, within 18 months, issue a report on them with recommendations regarding the rate of cesarean births.

Intrauterine Devices Informational Pamphlet (S9076, Gonzalez/ A10356, Rosenthal)

Amends the public health law to require the Department of Health to create an informational pamphlet, to be made available on the Department's website, for patients considering an IUD that describes the effectiveness, risks and side effects, the insertion process, and the pain associated with it, and how that pain can be managed, as well as alternative contraceptive methods if an IUD is not suitable. The bill also mandates that practitioners distribute said pamphlet to patients seeking contraceptives or interested in discussing contraceptive methods.

Rural Suicide Prevention Council (S3610-A, Helming/ A8434, Kelles)

This legislation establishes a Council on Rural Suicide Prevention which will include the Commissioner of the Office of Mental Health, the Commissioner of Health and the Commissioner of Agriculture and Markets. The Council will also include 12 additional members, four of whom will be appointed by the Governor, three appointed by the Speaker of the Assembly, three appointed by the Temporary President of the Senate, one appointed by the Minority Leader of the Assembly and one appointed by the Minority Leader of the Senate. The Council would examine the epidemic of suicide in rural New York and create a comprehensive plan to address it. The bill also outlines the qualifications for council members and the duties of the Council. The Council will meet no less than three times annually and the Council will provide a preliminary report of their findings within nine months of the effective date and a final report of their findings within eighteen months of the effective date.

Coverage for Brand Name Drugs when there is a Drug Shortage (A1428, Forrest/ S9497, Fernandez)

This legislation would ensure that if a covered generic drug is unavailable due to a drug shortage, state-regulated commercial insurers would be required to cover the brand-name drug at the same cost as the generic for the duration of the shortage.

Insurance Coverage for Image-Guided Breast Biopsies (A6561-B, Weprin/ S551-A, Bailey)

Includes image-guided breast biopsies under mandatory insurance coverage for breast cancer screening and diagnostic imaging purposes for state-regulated, commercial health insurance plans when recommended by a physician and in line with nationally recognized clinical practice guidelines.

All of us at Reid, McNally & Savage wish NYSAFP members and your families an enjoyable summer and thank you for your continued support for the Academy's successful advocacy program in New York State.

TWO VIEWS: Group Visits for Obesity Management

VIEW ONE

REIMAGINING OBESITY CARE IN FAMILY MEDICINE: THE POWER OF GROUP VISITS

By Leah Petrucelli, MD and Alisha Mir, MD

Obesity's impact reaches every level and bodily system. From decreased mobility and pain, to progressively worsening metabolic and mental health, patients with obesity have a higher risk for decreased quality of life.⁶ Unfortunately, obesity's prevalence is ever increasing with our broken health and food systems. One hundred and seventy-two million people are affected by obesity in the US, leading to an expenditure of \$174.06 billion annually between emergency room and hospital visits.^{5,8} We can, however, optimize our current reactive healthcare system's approach to reverse the insults driven by adipose tissue dysfunction and chronic inflammation.

Family medicine is on the front lines of empowering patients to address our obesity epidemic more proactively. We often fail due to our limitations in nutritional education, visit time, societal biases, and the ever-increasing demands of administrative tasks.² Addressing the rising rates of obesity requires creativity and curiosity, often limited by burnout. Group medical visits are one innovative approach to provide more comprehensive care to our patients struggling with obesity and reduce moral injury among physicians. A systematic review of 31 RCTs demonstrated that group visits improve our patients' experiences and healthcare outcomes while simultaneously decreasing healthcare costs.² This innovative way can help counter the multifaceted pathophysiology of obesity.

THE NEED FOR INNOVATIVE, HOLISTIC SOLUTIONS

While we know diet and exercise are significant factors in weight management, we need to broaden our approach. "Eat less, move more" is simply insufficient. Obesity is a complex condition influenced by genetics, food availability, socioeconomic status, chronic stress, gut health, and sleep patterns.⁷ For example, multiple RCTs have demonstrated that even 1 extra hour of sleep leads to significant caloric reduction (270 calories).⁷ We can teach our patients to support their natural satiety hormones just by broadening our focus to include sleep optimization. This fosters a more intuitive process, along with other lifestyle changes. Group visits allow for the time, creativity, and curiosity needed to brainstorm sustainable goals, through the often forgotten or sacrificed self-reflection, self-compassion, and self-discipline required to lose and maintain weight loss.

WHAT ARE GROUP VISITS?

Group medical visits are extended clinical encounters in which multiple patients with a shared health concern meet simultaneously with one or more health care professionals. These visits are designed to be more collaborative and comprehensive than is typically possible in standard individual appointments. Within family medicine, group visits provide dedicated time to focus on specific

VIEW TWO

GROUP MEDICAL VISIT (GMV) MODEL FOR OBESITY MANAGEMENT IN PRIMARY CARE: PRELIMINARY RESULTS FROM A COMMUNITY-PARTNERED LIFESTYLE MEDICINE MODEL

*By Amandeep Kaur, MD; Tochi Unegbu, DO and
Renee Rodriguez-Goodemote, MD*

INTRODUCTION

Obesity is a chronic, multifactorial disease and one of the most consequential noncommunicable diseases (NCDs) of our time, a broad category of chronic conditions including cardiovascular disease, diabetes, cancer, and respiratory disease that the World Health Organization has identified as the leading cause of mortality worldwide.¹⁹ More than 42% of U.S. adults now meet criteria for obesity, with prevalence projected to approach 50% by 2035.²¹ The CDC documented its rapid spread across the country as early as 1999,¹² and in 2013 the American Medical Association formally recognized obesity as a disease requiring treatment and prevention.¹

These diseases share a common origin. A small set of modifiable lifestyle behaviors (diet, physical activity, tobacco and alcohol use, sleep, and stress) drive the metabolic risks that lead to obesity, hypertension, and elevated blood glucose, and from there to the downstream complications that dominate primary care: type 2 diabetes, coronary disease, stroke, kidney disease, and osteoarthritis (Figure 1, page 13). Intervening upstream, at the lifestyle level, is therefore the highest-leverage point for prevention.⁸

The burden of disease is not evenly distributed. In New York State, obesity prevalence is approximately 30.8% statewide compared with about 24.2% in New York City.¹⁴ The disparity between rural upstate counties and the metropolitan area is among the most pronounced in the Northeast.¹¹ These differences are shaped by structural social determinants of health like regional economic vitality, food access, transportation, and access to health care that constrain opportunities for healthy behaviors in the communities served by health centers like ours.

Sustainable change ultimately requires modifying the constellation of daily behaviors (eating patterns, activity, sleep, screen time, stress, and emotional regulation) that drive both the development and the reversal of obesity-related disease. The U.S. Preventive Services Task Force recommends intensive, multicomponent behavioral interventions for adults with obesity precisely because brief, episodic counseling does not work.⁶ Yet delivering that intensity within a 15- to 20-minute primary care visit is rarely feasible. Counseling becomes omitted, fragmented, or reactive, which is exactly the opposite of what behavior change requires.

GMVs and shared medical appointments (SMAs) are emerging as a practical solution. A 2022 systematic review by Walker et al. found that SMAs can produce significant weight loss in adults, particularly

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concerns, such as weight management, while minimizing the time constraints and competing priorities that often limit traditional office visits. In addition to clinical management, group visits create opportunities for patient education, peer support, and community building. This approach has been shown to achieve more meaningful weight loss in several RCTs and retrospective studies compared to traditional individual visits.¹

Typical group visits have 4-10 patients meeting for 1-2 hours to discuss shared goals and barriers while learning from the providers and each other. In our clinic specifically, we start with a reflective writing activity over an herbal tea or fruit infused water to introduce them to simple ways to reduce sugary beverages. After sharing what they have written about a particular topic (food intake, movement inventory, sleep patterns, gut health, etc.), we transition to a 15-minute lifestyle medicine lesson before engaging in some form of movement tailored to the patients' limitations and possible injuries. We wrap up by brainstorming individual goals for the week ahead and a 5-minute meditation. Due to the extended time frame, skillsets, and overlapping goals, there is flexibility in activities and discussion, which often ends up being the most fruitful for patients. Physicians, too, look forward to these visits.

BENEFITS OF GROUP VISITS FOR OBESITY MANAGEMENT

A. Promoting Sustainable Lifestyle Changes

Group visits allow us to deviate from a pattern of generalized nutritional guidance and instead focus on real world strategies. In a group, we can reinforce nutrition lessons weekly, adjust personalized SMART goals when not effective or sustainable, and provide support when barriers surface. Patients have the time to determine their own goals with clinician guidance which allows for more realistic starting points that steer clear of black and white advice that can be tone deaf to social barriers and different cultural traditions. This process can be more rewarding for physicians trying to move the needle.

B. Reducing Stigma and Isolation

Group visits facilitate discussion of the psychological and social dimensions of chronic illness, including experiences of weight stigma and fat phobia. Through shared experiences, this setting allows participants to celebrate successes, discuss challenges, and brainstorm strategies for behavior changes together. The added time allows for both self-reflection and countering the fat phobia that is rampant in health care and society. By normalizing the difficulties associated with weight management, we can reduce shame and self-blame which often limit discipline and progress. By emphasizing education, self-awareness, and sustainable behavior change rather than focusing exclusively on weight, BMI, or laboratory values, group visits promote a compassionate, patient-centered approach to care.

C. Enhancing Patient Education

Additionally, education is a huge part of the solution. Group visits provide an opportunity for more detailed discussions of nutrition, metabolism, and environmental factors that influence weight regulation. This format allows patients to develop a more nuanced understanding of how their bodies respond to food, appetite signaling, and highly processed, hyperpalatable foods. We have had a lot of success in incorporating conversations around food addiction evidence to help shift the focus away from a reductive "eat less, move more" blame-based strategy. In contrast to the limitations of brief individual

appointments, group visits enable clinicians to move beyond these oversimplified recommendations and provide more in-depth education regarding the multifactorial nature of obesity and weight loss. This paves the way for concrete, individualized goal-setting that can actually move the needle. In addition, the presence of peers reduces the intimidation some patients experience in medical settings.

One of the most unique educational components in group visits is the teaching that occurs from patient to patient. This is an effortless part for the physician, but invaluable to the patient. We have often seen patients with overlapping shame, social barriers, and family challenges supporting each other and providing realistic suggestions for incorporating movement, diet changes, and mindfulness approaches to weight management. One patient shared, "I feel less alone when I come to groups, and I am learning to be kinder to myself." The psychological component of obesity-related health concerns can no longer be ignored and is an imperative part of successfully addressing weight.

D. Improving Clinical Efficiency

Additionally, group visits increase clinical efficiency by providing more frequent follow ups with multiple patients at one time. For instance, clinicians can address issues such as medication adjustments or elevated blood pressure in real time rather than deferring management to months later. This not only enhances patient care but also minimizes provider workload at subsequent visits. Regarding weight management appointments specifically, the group visit provides patients with a stronger foundational knowledge which allows for shorter follow up appointments, increased adherence to recommendations, and faster progress towards goals such as improved glycemic control. This education may better equip patients to successfully engage in lifestyle modifications for conditions such as diabetes and obesity, reducing the need to resort to polypharmacy.

Many patients prefer natural approaches to health over medication, and this can be better addressed with the more frequent follow ups that group visits provide. In our groups, we have seen decreases in blood pressures with improved adherence to medicinal foods like hibiscus tea, which has been shown to be just as effective as some ACE inhibitors without the side effects.³ Patients in our groups have also noted an increase in openness to preventative screening and decrease in their fear of doctors, which may impact white coat hypertension. This is especially important in minority groups who have been disproportionately taken advantage of by medical research and healthcare systems. These patients deserve to be prioritized in our newest health care initiatives.

E. Addressing Health Disparities

It is now well recognized that social determinants of health impact weight and chronic disease acquisition.⁵ Group visits allow for creative, culturally competent dietary recommendations that incorporate patients' financial barriers. The extended time allotted for patients in group visits allows for discussion of needed social resources as well as brainstorming unique and individualized SMART goals based on patients' own trial and error. Additionally, the frequent touch points provide space to adjust goals when the inevitable setbacks surface in a more time sensitive fashion. Our patient population specifically benefits from the added support and creativity due to their decreased

among women and older adults.¹⁸ In a 2021 cluster-randomized trial across 36 rural primary care practices, Befort et al. showed that in-clinic group visits produced significantly greater weight loss at 24 months than individual visits (−4.4 kg vs −2.6 kg).³ Russell et al. (2020) delivered a GMV with an integrated physical activity component at a federally qualified health center in Rochester, NY, a setting closely resembling ours, and demonstrated significant weight loss sustained at six months.¹⁶ A 2025 joint advisory from the American College of Lifestyle Medicine, American Society for Nutrition, Obesity Medicine Association, and The Obesity Society endorsed GMVs as “an increasingly established, evidence-based modality” for equitable obesity care,¹³ and recent JAMA and JAMA Internal Medicine reviews describe group-based delivery as a viable modality for intensive behavioral intervention in primary care.^{7,20}

SMAs have also shown benefit in prediabetes, producing greater weight loss and HbA1c reduction than usual care.¹⁵ The evidence extends beyond weight: in a randomized trial by Trento et al. (2001), patients with type 2 diabetes who attended quarterly group visits saw their HbA1c drop from 7.3% to 6.8% over two years, while those receiving usual individual care worsened.¹⁷

Building on this evidence, we developed a GMV program at Saratoga CHC that intervenes at the lifestyle level, supported by community partnerships with the YMCA and a local farm, with the goal of preventing the downstream complications that follow when obesity goes unaddressed. The program also serves as a

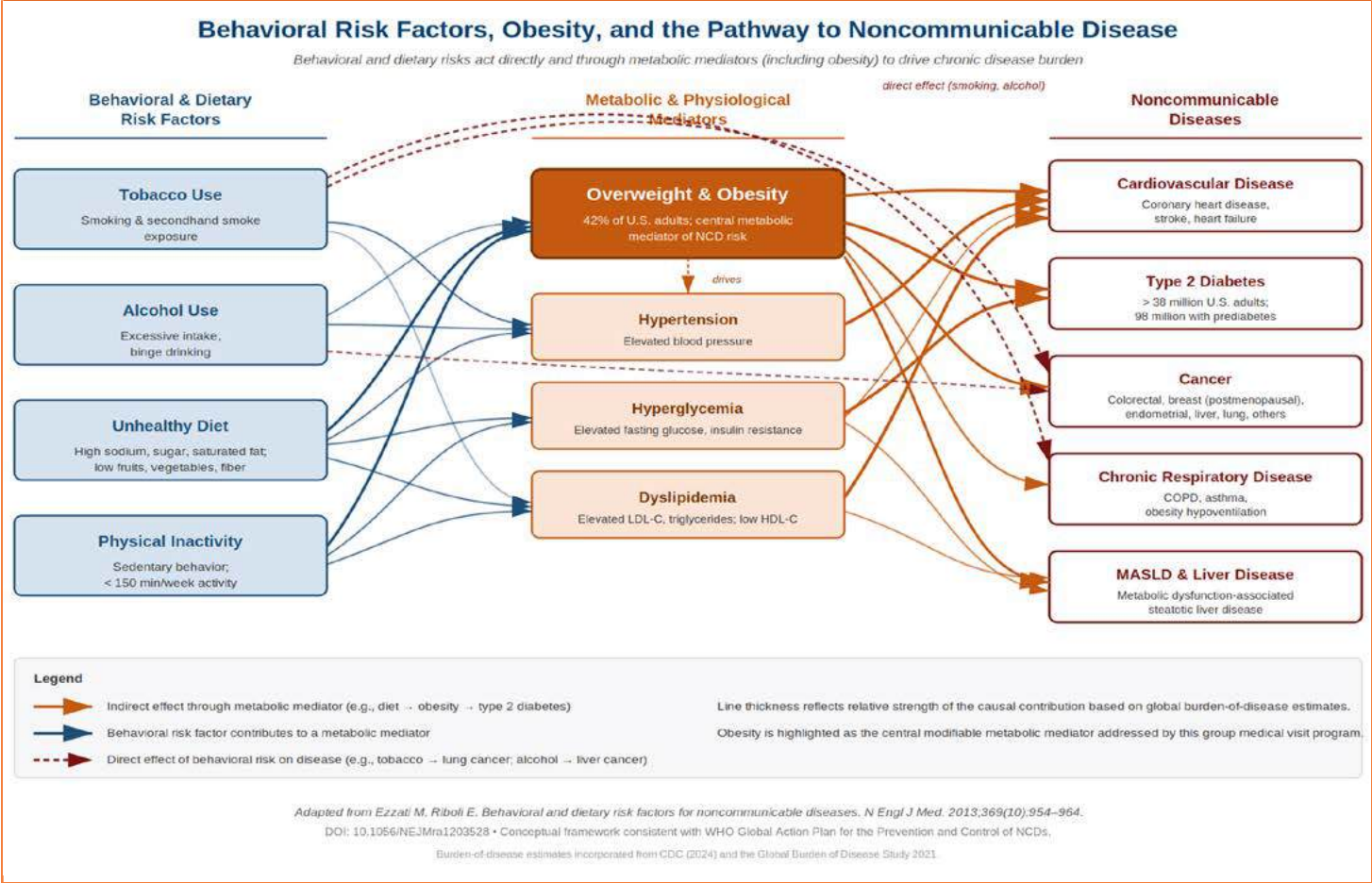
teaching platform for family medicine residents, integrating patient care with hands-on training in lifestyle counseling and group facilitation. This report presents preliminary results from our first program year of structured data collection.

METHODS
Setting and Program Design

Saratoga CHC is a community health center serving a predominantly low-income population in upstate New York. Patients participate in weekly 60-minute sessions focused on nutrition, behavior change, movement, and SMART goal development, with a “food as medicine” framework rather than a weight-loss-only model. In each session, participants review the prior week’s goal and set an individualized SMART goal, enabling the care team to track engagement and behavior change longitudinally. Sessions also include dedicated 1:1 time, allowing the family physician to guide each patient in selecting weekly goals that support healthy behaviors while targeting individual chronic conditions. From an operational and financial standpoint, these visits were structured as billable shared medical appointments within primary care workflows. Individualized physician interaction during each session allowed visits to be billed using established outpatient evaluation and management (E/M) coding, most commonly CPT99212- 99213, based on chronic disease management and medical decision-making addressed during the encounter. Family medicine residents help design and facilitate sessions during ambulatory rotations, gaining direct experience in

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Figure 1. Behavioral and dietary risk factors, obesity, and the pathway to noncommunicable disease.



resources and opportunities.⁵ One of the patients in our group visits frequently commends the diversity of patients as well as the inclusivity in care delivery, which keeps her coming back. Patients can learn from each other, share recipes, and offer solutions. This support can reduce feelings of isolation, rampant in patients struggling with both their weight and the inequities that they face.

F. Behavioral and Psychological Dimensions

Progress is not linear, and family doctors can team up with our patients to help them make small practical changes and pivots when the inevitable setbacks surface. In addition to addressing social barriers, group visits provide frequent touch points needed to overcome the body's elevated physiologic set point. It can feel impossible to sustain weight loss without significant social or pharmaceutical help due to our body's automatic increase in hunger cues and cravings after any initial weight loss.⁴ Additionally, metabolism slows with food restriction, directly opposing our patients' goals.³ This paves the way for worsening yet preexisting shame and isolation. However, many patients in our group have noted improved self-image and decreased isolation due to being able to share their many challenges of weight loss and prepare for their bodies' responses. One patient stated, "I see myself better with this group." The roles of accountability, peer encouragement, and social support allow for increased resilience and self-efficacy while addressing our inherent automatic negative thoughts. We have incorporated other providers including therapists and have used modalities such as CBT, art therapy, and mindfulness in our groups with much success.

PRACTICAL IMPLEMENTATION STRATEGIES

Creating a big change in our clinic environment can be intimidating. We recommend starting with a topic that is most important to your clinic's patient population, such as managing pain or weight loss. A popular entry point allows providers to easily branch off to other health related factors and meet competing priorities. We recommend two providers running the visit to account for the patient vitals, exams, and assessments needed to bill for the visit. We utilize patient navigators for group visit reminders, but this can be done by any additional staff member to lessen the load on the physician. Our system utilizes a capitated and fee-for-service billing model. Both types can support group visits with different factors prioritized. In a capitated model, group visits allow for more comprehensive care to prevent ER and hospital visits, saving money down the road. In a fee-for-service model, the focus would have to be on recruitment to maintain the same number of patients needed to sustain the clinic. We have found that patients are most willing to try out a group visit if suggested by their primary care doctor who they already have rapport with. Lastly, a consistent schedule is essential in maintaining patient attendance.

CONCLUSION

Group visits allow for the needed intentionality to comprehensively address the many factors influencing weight, while continuing to review care gaps, manage chronic disease, and conduct preventative screening. Collaboratively focusing on nutrition and lifestyle interventions helps us move away from fat phobic and impractical, tone deaf recommendations. This shift gives patients an understanding of how small changes can make a big impact, how common food addiction is, and how to overcome it, as well as

resources to offset financial barriers. This transformative approach is gaining traction and can easily expand to other chronic conditions outside of obesity. Group visits provide the time, follow up, and community to collectively create solutions necessary to move the needle. This model shifts us from talking about prevention to facilitating prevention.

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lifestyle counseling, obesity medicine, and care of underserved populations. To better understand patient barriers, we administered a pre-intervention survey before the series.

Community Partnerships

Two community organizations anchor the program. Pitney Meadows Community Farm provides participants with fresh, locally grown produce and hands-on nutrition education.¹⁰ The YMCA of Saratoga provides free memberships, eliminating a cost barrier to physical activity and connecting participants to an evidence-based community fitness infrastructure.⁴

Physical Activity Component

A dedicated exercise component, supervised by a physical therapist, was incorporated into the GMV to address the physical activity dimension of lifestyle medicine. The component provides structured, accessible, and supportive exercise within the healthcare setting, directly addressing barriers that disproportionately affect low-income populations, including limited access to fitness facilities, transportation, and safe places to exercise. Movement-based group activities such as walking and gardening sessions are also incorporated to combine moderate physical activity with peer engagement.

Functional capacity is tracked using three validated measures, with post-intervention data collection planned. The 30-second sit-to-stand test (30CST) is a validated assessment of lower-extremity strength and endurance and a core component of the CDC’s Stopping Elderly Accidents, Deaths, & Injuries (STEADI) fall-risk screening toolkit.⁵ The Short Form Health Survey (SF-12) produces physical and mental component summary scores standardized to the U.S. general population (mean = 50, SD = 10), with scores above 50 representing above-average health.¹⁹ The 6-minute walk test (6MWT) measures functional exercise capacity and predicts morbidity and mortality across COPD, heart failure, and obesity. Pre- and post-test vital signs (blood pressure, heart rate, SpO₂) are also recorded.²

Results

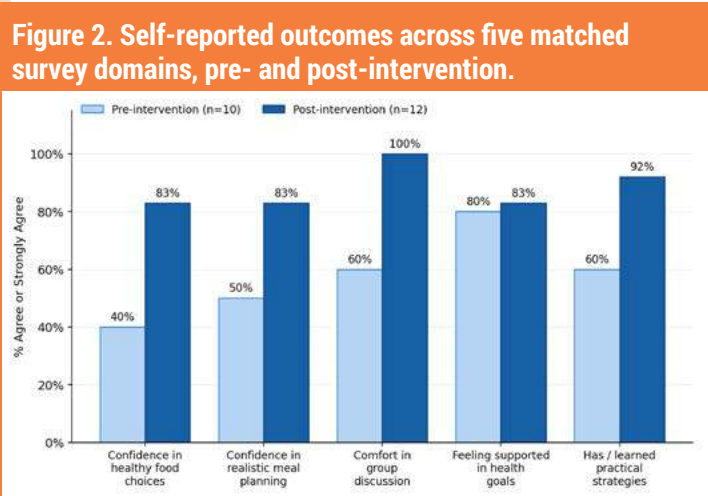
Twelve patients enrolled in the program; 10 completed the pre-intervention survey and 12 completed the post-intervention survey. The most-commonly-endorsed goals were building sustainable habits, improving eating, weight loss, and improving heart health (Table 1). Stress or emotional eating emerged as the most-commonly-reported barrier (7 of 10 respondents).

Table 1. Participant characteristics and goals.

Metric	Result
Total participants enrolled	12 (pre-survey n=10; post-survey n=12)
Most common primary goals	Build sustainable habits (9), Improve eating habits (7), Lose weight (7), Improve heart health (7)
Most commonly reported barrier	Stress or emotional eating (7 of 10)

Across five matched survey domains, participants reported directional improvement on every item (Figure 2). Confidence in making healthy food choices rose from 40% to 83%, confidence in realistic meal planning from 50% to 83%, comfort participating in group discussion from 60% to 100%, and the proportion endorsing that they had learned practical strategies for healthy eating from

60% to 92%. Perceived social support showed minimal change (80% to 83%), reflecting a high pre-intervention baseline.



Acceptability and satisfaction were uniformly strong. All participants reported understanding the information provided and rated facilitators as clear and respectful; 92% endorsed that the content was relevant to their personal health goals; and 100% indicated they would recommend the program to a friend or family member, with 92% strongly agreeing. Ten of 12 (83%) reported a concrete plan either to start a new healthy habit (n=7) or to continue one they had already begun (n=3).

Qualitative responses described real behavior change (Table 3), including reduced sugary beverages and screen time, improved sleep, more mindful eating, and the adoption of realistic goals. One participant referenced sustained smoking cessation and improved mood, suggesting effects beyond diet and weight. Peer support surfaced repeatedly as a motivator, captured in statements like, “I’m not alone” “I felt accepted,” and “We all struggle with something.”

Table 3. Reported behavior changes following GMV participation, with representative participant responses.

Reported change	Representative participant response
Improved eating habits	“Eat more mindfully, eat more protein”
Reduced sugary beverages	“Changed from sugary beverages to seltzer and water”
Improved sleep habits	“Working on better sleep habits”
Reduced screen time	“Started not turning on the TV and started reading”
Realistic goal setting	“Setting doable, realistic goals”
Sense of belonging / peer support	“I’m not alone, I felt accepted”; “We all struggle with something”

With respect to the functional component, participants exercise together in a group setting under professional supervision, which increases accountability, builds confidence, and fosters social connection. Baseline functional assessments revealed reduced capacity and below-average SF-12 scores across many participants, including younger patients unable to complete more than six sit-to-stand repetitions were well below age-expected norms. Our early observation

revealed that many participants demonstrated reduced functional capacity and below average health scores, emphasizing the significant physical and psychological burden of obesity.

DISCUSSION

These preliminary findings are consistent with the published GMV evidence base. The group structure functions as more than a delivery format; it is an active ingredient of the intervention. Participants engage in peer discussion, share challenges, and solve problems collaboratively, a mechanism associated across multiple chronic disease populations with improved patient activation, self-efficacy, and adherence to self-management behaviors.⁹ In our pilot, 100% of participants reported comfort in the group setting and many specifically identified peer connection and shared experience as meaningful, mirroring patterns established in the published literature.^{3,4}

The clinic environment reinforces the effect. Protected group time within a familiar primary care setting creates a space that feels safe, supportive, and free of judgment, which empowers patients to discuss barriers openly and commit to incremental changes they can build on over time. The combination of a trusted clinical setting, structured peer interaction, and direct access to community resources differentiates this model from traditional one-on-one counseling and from purely community-based programs. The baseline functional findings also underscore the physical burden of obesity in this population, supporting the rationale for integrating a structured exercise component within the GMV.

LIMITATIONS

This is a small, single-site pilot (pre-survey n=10; post-survey n=12) conducted over an initial 8-week session block, and its findings should be interpreted accordingly. Outcomes are participant-reported rather than objectively measured. There is no comparison group, which limits causal interpretation. Surveys were anonymous and did not include identical pre- and post-items, precluding paired individual-level analysis and limiting direct comparison to five matched domains. Participants were identified by their primary care physicians based on interest and readiness for behavior change, which may inflate engagement and satisfaction findings and limits generalizability to less motivated patients. Longer-term clinical outcomes (weight, blood pressure, hemoglobin A1c) and post-intervention functional measures (30CST, SF-12, 6MWT) are still being collected. These constraints are typical of early-stage program evaluation and define the scope of what this initial cohort can demonstrate: feasibility, acceptability, and early behavioral signal rather than definitive efficacy.

CONCLUSIONS

Despite the limitations, directional improvement was observed across every measured survey domain, and the convergence of quantitative and qualitative findings supports the program's early success indicators. Preliminary results suggest that a community-partnered, lifestyle-focused GMV model is feasible, acceptable, and associated with early improvements in self-reported confidence, engagement, and health behaviors among patients receiving obesity care in an underserved primary care setting. Our findings are consistent with a growing body of literature showing that GMVs can support meaningful behavior change and weight-

related outcomes in primary care, including in underserved and rural populations.^{3,18,16}

The model is well suited to reproduction within family medicine because it relies primarily on existing clinic infrastructure, team-based care principles, and locally available community partnerships. Sessions are conducted within routine ambulatory workflows and incorporate residents as facilitators creating both a patient care intervention and a scalable educational model. The program does not depend on expensive technology or highly specialized obesity centers. The core components (protected group time, SMART goal tracking, multidisciplinary collaboration, and community engagement) can be adapted by other residency programs and primary care practices seeking practical approaches to lifestyle medicine and obesity management. Where formal partnerships such as a YMCA or community farm are not available, similar functions can be supported by local fitness, nutrition, and food-access resources. By intervening at the lifestyle level, this model offers family medicine a practical tool to address obesity before its downstream complications take hold.

FUTURE DIRECTIONS

Our initial 8-week block demonstrated sufficient benefit, and generated enough participant feedback, that we elected to continue group medical visits on a year-round basis rather than as a single time-limited intervention. Recognizing that a fixed curriculum cannot sustain engagement across a full year, we developed a sequence of themed blocks, each running 8 to 12 weeks with a distinct clinical focus, so that returning and new participants encounter fresh, season-appropriate content. The current schedule is structured as follows:

- **Healthy Bodies (February–April):** obesity management, nutrition, physical activity, and behavior change: the focus of the present report.
- **Eight Dimensions of Wellness (April–June):** Holistic wellness across multiple domains of health and wellbeing, supported by SAMHSA.
- **Nutrition Rx (July–September):** Food as medicine principals, nutrition education, and healthy food access, partnership with a community farm, providing participants direct access to community-supported agriculture (CSA).
- **Chronic Pain (September–October):** Provide lifestyle and self-management strategies to improve function, quality of life and symptoms management for patients living with chronic pain.
- **Winter Wellness (October–December):** Strategies to sustain healthy habits and prevent regression during holiday season

Several refinements in this schedule were made directly in response to participant feedback from the initial block, and we anticipate that sustained, year-round programming will produce more durable behavior change than a single 8-week cycle. Future evaluation will track longitudinal outcomes across these blocks, including retention, repeat participation, functional measures, and objective clinical markers where available, to assess whether the engagement observed in this pilot translates into measurable long-term health gains.

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What Patients Are Seeing: A Primary Care Guide to Compounded GLP-1s, Telehealth Prescribing, and “Natural” Peptide Marketing

By Mary Kristine Ellis, MD, FAAFP, DABOM; Mark Maloof, DO, DABOM and Sarah Son

Introduction

With the massive impact that social media has on society these days, it is of no surprise that obesity care is increasingly occurring outside of the doctor's office. In the past few years, the GLP-1 market has grown exponentially so much that patients now are able to access GLP-1 through direct-to-consumer telehealth companies. These online companies advertise compounded GLP-1, microdosing protocols, and the claims of “natural peptide” alternatives.

While FDA approved GLP-1 and dual GLP-1/GIP medications are associated with up to 15-20% weight loss, there is a lack of evidence for these online GLP-1 alternatives nor are they FDA verified and approved.^{1,10}

Direct to Consumer Telehealth Platforms: Branded/ Generic GLP-1 and Compounded GLP-1

Our review revealed that there are several online companies where consumers can get branded or generic GLP-1 such as semaglutide, tirzepatide, and now orforglipron with monthly membership fees. Patient experience varies from required video visits with a provider such as a doctor or an advanced practice provider to asynchronous care. Some companies interface with insurance for the brand name medications, but out of pocket prices can range from \$299 to \$1000 per month. For some, prices increase as the dose increases. In January 2025, the FDA approved an oral form of semaglutide and in April of this year it approved orforglipron, a daily oral pill made by Eli Lilly for weight loss. These sites are now making the oral pill available through various payment models like the injectables. The pill and injections have comparable results, averaging 5-21% weight loss.^{1,13} Medications through these online companies are usually sent to your local pharmacy or delivered.^{2,4}

Alternatively, there are online companies such as Noom that only offer compounded GLP-1 and cash pay only.³

The surge of online compounded GLP-1 availability emerged in 2022 because of a shortage of FDA approved GLP-1 brand name and generic drugs. At that time, the FDA allowed compounding pharmacies to produce their own versions of GLP-1s. Since then, online platforms continue to proliferate, and a poll recently showed that 11% of people taking GLP-1 are getting them from an online website.⁶

Despite this, the FDA does not verify the safety, efficacy or quality of these compounded drugs and federal regulations are less stringent for the advertising of these drugs.⁶ Because this growing trend is not stopping, the FDA issued over 30 warning letters to telehealth and compounding providers for misleading consumers with their claims of efficacy and equivalence to FDA approved brands of semaglutide and tirzepatide. Those letters highlight risks of contamination, dosing errors, and unverified forms of the mentioned GLP-1s.⁷

The FDA also announced its intention to restrict active pharmaceutical ingredients used in these non-FDA approved compounded GLPs-1 as a result.⁷ Now that the production of FDA approved GLP-1 has caught up with the need, the legal basis for large scale compounding has weakened and supports the FDA's planned restrictions on compounded GLP-1.⁷

Microdosing

Evidence shows that the most common side effects of FDA approved GLP-1s are gastrointestinal, including nausea as the most common (19%), followed by vomiting (8%) diarrhea and constipation. These are also the most common

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reasons for GLP-1 discontinuation. In clinical trials, 6.5% of GLP-1 users quit their meds due to side effects.⁵

Microdosing has made its way into the limelight as telehealth companies advertise GLP microdosing programs. This program usually means consumers will start at a dose lower than the labeled starting dose. For instance, semaglutide has a starting dose of 0.25mg weekly, but microdosing would start at 0.1mg or 0.125mg weekly. Whereas standard GLP-1 dosing increments usually happen every 4 weeks, microdosing increments go beyond this recommendation, for example eight weeks instead of four.¹²

Telehealth platforms such as NOOM have, since August 2025, marketed “Microdosing GLP-1rx Program” to mitigate said GLP-1 side effects. These, however, have not been studied in clinical trials.¹² The company’s website advertises individualized titration protocols alongside app-based behavior change to support weight loss while minimizing side effects. The company claims that there have already been strong weight loss outcomes at low doses citing evidence from one study in Denmark where participants experienced as much as 16.7% weight loss with microdosing of 0.8 mg in 64 weeks.¹¹ One of the benefits of such microdosing programs is the cost. Programs such as NOOM start at \$99 and then continue at \$199/per month.^{8,9} For context, Novo Nordisk has semaglutide 0.25mg at \$499/month directly available through their NoVo Care Pharmacy, further highlighting the draw to these microdosing protocols.⁸ As family doctors, it is important to educate your patients about these online protocols and discuss the lack of evidence for microdosing and that cost could be similar overall if they are on microdosing for an extended period. Overall, standard titration can be a fit for patients who tolerate GI side effects and can have regular provider check ins, while the more conservative approach of microdosing may be helpful for patients with GI sensitivity issues.¹² Again, there is no clinical evidence for these microdosing protocols which highlights the importance of shared decision making with your family doctor and specialists if needed.

Natural GLP-1 Supplement

It is noticeably clear that when scrolling through social media, algorithms for natural GLP and peptides are consuming your feed. There seems to be more companies that are advertising natural GLP or peptides for those that are less interested in injections and prescription medications. These supplements are marketed under “GLP-1 boosters”, “GLP-1 support”, or “natural GLP-1 alternative.” Other common labels patients see online are: “Nature’s Ozempic,” “metabolic reset peptides,” or “peptide-based weight loss.” It is important to recognize that these are supplements and that none are actual medications and do not actually contain GLP-1. After reviewing several online websites that market these supplements, our research showed that most of these contain herbs, plant protein extracts or pre- and post-biotics, and nutritional yeast. These supplements come in pills, gummies, powders, and even patches.

For these supplements, there is no FDA review for safety and efficacy, and most lack any clinical trial evidence.

It is important to point out, however, that there is a concept that was published in *Obesity Pillars* in 2025 which could be considered, namely, that there should be dietary supplement considerations during GLP-1 treatment. This review highlights how certain dietary supplements can support metabolic health and mitigate side effects while on GLP-1 drugs. The review gives guidance for adjunctive use of supplements and their benefits when used in conjunction with GLP-1 therapy. Multivitamins, vitamin D and omega 3 fatty acids can fill nutritional gaps, while protein, whey, creatine and HMB (B-hydroxy B-methylbutyrate) can preserve lean mass during weight loss. Fiber and probiotic supplements can reduce constipation and improve stool consistency, which is a common side effect of GLP-1.¹⁴

The reality is that there is no natural supplement that acts as a GLP-1 receptor agonist. As noted in the *Obesity Pillars* review, there are certain botanicals and nutrients that can enhance glucose control, reduce appetite, and support weight management in a complementary way.¹⁵ Berberine has been marketed online as “nature’s Ozempic.” Berberine does have the most research-backed evidence as a natural supplement for metabolic health. It has been used in traditional Chinese medicine and activates the AMPK (AMP-activated protein kinase) a key metabolic enzyme. Berberine has been shown to improve insulin sensitivity and reduce insulin resistance while increasing gut bacteria that produce SCFA (short chain fatty acids) reducing inflammation overall. Average weight loss with berberine has been seen at 2-3kg in over 12 weeks in comparison to GLP-1 medications, which average at 10-15kg. The standard dosing for berberine is 500mg 2-3 times a day. Side effects include GI effects such as diarrhea and constipation. Patients should be aware of the interactions with prescription medications such as metformin, cyclosporine, and statins.¹⁵

Conclusion

The evolving landscape of obesity care highlights the importance of shared decision-making and patient education; areas where the family physician play a vital role. As more online platforms emerge offering prescription GLP-1 medications, compounded formulations, and now self-proclaimed “natural peptides,” it is critical for clinicians to be equipped with accurate, evidence-based information. Current data support only FDA approved GLP-1 receptor agonists as safe and effective for weight loss management. Understanding what patients are encountering online will help us guide their care that is both backed by evidence and responsive to real world trends. The attached charts are a summary of some of the most advertised telehealth companies and supplement brands. These lists will continue to evolve just as the marketplace does. In addition, the first chart does reference *matchglp1*, a website that compares every telehealth company, compounding pharmacy, and manufacturer program offering semaglutide and tirzepatide.

Common GLP-1s on the Market					
Product Name	Active Ingredient	Self- pay per month	Savings Card	Payment Options	Access Pathway
Wegovy Pill*	Semaglutide	\$149-299	25 per/mo	Insurance, Membership Plan, Savings Card, Cash/Credit	1,2,3
Wegovy Pen*	Semaglutide	\$199-499	25 per/mo	Insurance, Membership Plan, Savings Card, Cash/Credit	1,2,3
Zepbound Vial/Pen*	Tirzepatide	\$299-449	25 per/mo	Insurance, Membership Plan, Savings Card, Cash/Credit	1,2,3
Foundayo Pill*	Orforglipron	\$149-349	25 per/mo	Insurance, Membership Plan, Savings Card, Cash/Credit	1,2,3
Compounded GLP-1	Semaglutide	\$99-249	25 per/mo	Membership Plan, Cash/Credit	1,2,4
	Tirzepatide	\$180-359			
	Liraglutide	Starting at \$115			
Microdose GLP-1	Semaglutide	\$99-199	N/A	Membership Plan, Cash/Credit	1,2
	Tirzepatide	Starting at \$169			
*Pricing varies based on dosage					
Access Pathways:	1	Assessment, Async Consultation, Prescription/Plan Selection, Home Delivery/In-store Pickup			
	2	Assessment, Video Consultation, Prescription/Plan Selection, Home Delivery/In-store Pickup			
	3	Prescription from Telehealth/Provider, Manufacture, Home Delivery/In-store Pickup			
	4	Prescription from Telehealth, Pharmacy, Third Party Compounding, Home Delivery			
Information from Match GLP-1 ¹⁶					

Endnotes

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Summary of GLP-1 Alternatives						
GLP-1 Alternatives	Product Name	Top Ingredient	Company	What is Promised?	Mechanism of Action	Price
Bioactive Peptides	FIT Capsules	Fava Bean Peptides	MAKE Wellness	-47% less fatigue -4x protein synthesis -44% strength recovery	Fava bean peptides increase protein synthesis	\$130
	LEAN Capsules	Yeast Hydrolysate		-65% fat loss from trunk area -Decrease daily caloric cravings up to 600 Kcal	Yeast hydrolysate may suppress appetite	\$100
Berberine	Berberine Patches	Berberine Extract	Kind Patches	-Complement weight loss journey	Vitamins and plant extracts are absorbed transdermal	\$15
	Berberine Capsules	Berberine Extract	The Absorption Company	-Curbs appetite and sugar cravings -Boots metabolism	Shielded from liver and gut metabolism to deliver more active berberine	\$49
GLP-1 Support	MB-1 Capsules	Cissus Vine Extract	arrae	-Reduce body weight up to 12% -Curb cravings and regulate appetite	Cissus Vine extract inhibits the absorption of carbohydrates and fats Chromium increases AMPK	\$65
	MB-1 45+	Dichrostachys Glomerata (Fruit) Extract		-Reduce fat up to 18% -Boost GLP-1 levels -Relieve menopause symptoms	Extract boosts GLP-1 by inhibiting DPP-4	\$69
	lemme Reset Capsules	Lemon Fruit Extract	lemme	-Increase GLP-1 levels -Support fat reduction	Lemon extract increases GLP-1 levels Saffron produces mood-improving effects to reduce snacking	\$80
	WLP-1	African Mango Extract	The Absorption Company	-9lbs of weight reduction in 4 weeks -Boost natural GLP-1 levels 321%	African Mango balances adiponectin to shrink fat cells and regulate appetite	\$99

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The Baggage of Bias: Examining Weight Bias Internalization in our Patients

By Mark Maloof, MD; Mary K. Ellis, MD, FAAFP and Sarah Son

Medical education around bias in obesity is often spent on external bias, rather than painting the complete picture. Explicit bias is the conscious, deliberate, negative behaviors and actions people openly maintain regarding a person's weight. Implicit bias is the automatic, unconscious reflections of past experiences or misinformation that lead to negative attitudes, thoughts, or actions. Explicit and implicit weight bias both fall under the umbrella of weight stigma. But the harm of an overweight person's internalization of bias is rarely thought about clinically.

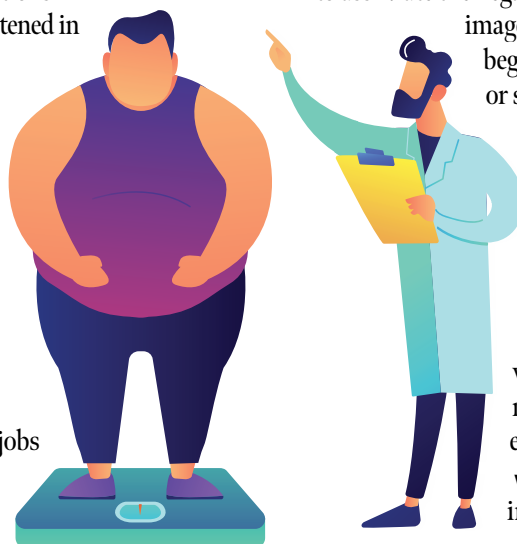
Obesity has long been recognized as one of the most stigmatized chronic medical conditions. In 1999, the Stigmatizing Situations Inventory was first validated and recognized 11 scenarios in which people with excess weight experienced stigma: (1) verbal comments from family members, (2) unsolicited remarks from strangers, (3) random statements from children, (4) comments from doctors, (5) stares in public, (6) social avoidance and exclusion, (7) visible embarrassment from loved ones, (8) unfair negative assumptions like laziness or lack of willpower, (9) physical barriers like seats, turnstiles, exam tables, or gowns, (10) job discrimination including pay disparity and being passed over for promotions, and (11) being physically attacked. More than 75% of overweight and obese people have experienced at least seven of the eleven stigmatizing situations.¹ As many as 42% of adults with obesity have experienced some form of weight discrimination.² Negative attitudes regarding obesity are widespread, socially acceptable, and learned early in life.³

In healthcare, efforts to try and reduce bias have only been partially successful. Studies following medical students uncovered a hidden curriculum – as students progressed through their training and moved from textbooks to clinicals, implicit bias decreased while explicit bias increased. Given the opportunity to interact with patients, students were allowed to dispel their own preconceptions surrounding obesity; however, students listened in as obese patients were the most common targets of derogatory humor and blame for their condition by attending physicians and residents.⁵ The bias continues into practice. Physicians spend less time in appointments and provide less education about health to patients with obesity compared to thin patients.² As their patients became heavier, physicians judged them to be less healthy and less disciplined.² As their patients' BMI increased, physicians reported liking their jobs less and having less patience and desire to help. The negative influences on

engagement with primary health care services due to weight bias have been organized into ten themes: (1) contemptuous, patronizing, and disrespectful treatment (2) lack of training (3) ambivalence (4) attribution of all health issues to excess weight (5) assumptions about excess weight gain (6) barriers to health care utilization (7) expectations of differential health care treatment (8) low trust and poor communication (9) avoidance or delay of health services, and (10) seeking medical advice from multiple HCPs.²

Obese people feel stigmatized in all facets of their life and the negative attitudes towards them in healthcare do not go unnoticed. In fact, doctors were reported as the second most common source of stigma with 69% of patients surveyed reporting experiencing stigma, often as inappropriate comments about their weight, at least once and 52% reporting it multiple times.⁵ The healthcare system stigmatizes obesity overtly with many public and private health insurers having limitations or exclusions in coverage for medical and surgical management of obesity, in stark contrast to the coverage of other chronic diseases.² This combination leaves patients feeling abandoned and patients shy away from their care entirely. Obese patients are less likely to undergo age-appropriate screenings for cancer prevention and delay or forgo routine preventative care.⁵ Those who experience weight-based discrimination are more likely to have increased weight over time, increased waist circumference, increased likelihood to progress from overweight to obese, and, if diabetic, poor glycemic control and depressed symptoms. External bias is also implicated in heightened blood pressure, increased cortisol, increased appetite, increased calorie consumption and binge eating, and avoidance of physical activity.⁴

Experiencing stigma and internalizing stigma, though considered related, are independent constructs.⁴ After being exposed to years, if not decades, of bias, stigma, and discrimination, some patients start to associate the negative societal concepts around weight or body image with the core concept of their identity. They begin to assign and even believe they deserve blame or suffering due to their weight. This leads to emotional, psychological, and eventually physical consequences for the individual that would be far greater than one without weight bias internalization (WBI). A person without WBI would instead perceive discrimination as an undeserved action from a prejudiced perpetrator rather than an act that was fitting for them due to their weight.⁶ A majority of people with WBI have already experienced some form of stigma. Those with WBI are at higher risk for weight gain, thus increased future risk for additional



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discrimination, and further internal stigma, trapped in a vicious cycle.⁷ A 2018 study estimates that 40-50% of overweight or obese adults experience WBI.⁶ It may be more prevalent in women than in men,² though authors have also acknowledged that the unique presentation of body dysmorphia in men may not be captured by previous screening tools. Separate from the effects of stigma, WBI is independently associated with heightened cardiometabolic risk, hypertriglyceridemia, dyslipidemia, metabolic syndrome, disordered eating and depressive symptoms.⁴

Recognizing that internalization of stigma is more robustly associated with negative outcomes than direct experiences is very important to us as clinicians.⁶ These patients' negative self-perceptions frequently exacerbate not only their obesity-related health problems, but also their continually worsening self-image. Patients with WBI also experience psychological distress more profoundly than through stigma alone, which makes navigating through life more challenging. Overweight persons do not hold more favorable attitudes towards other overweight persons, and sometimes the overweight person they hold in lowest esteem is themselves. Personal dissatisfaction with current weight, predicted physical and mental health impairment to a

greater extent than BMI.⁷

With prevalence being nearly half of all overweight patients, how does one screen for WBI? Consider screening in a patient that exhibits binge eating behavior, continuous reduced physical activity, lack of motivation or engagement in the care plan,⁶ or those with poor coping skills. Patients who have WBI will generally show reduced progress with weight loss goals compared to those without WBI. Part of the reason for the inability to achieve or maintain weight loss has been identified as a narrow range of coping skills when exposed to negative emotions. Patients with WBI are more likely to have avoidant or impulsive styles of coping and tend to eat in response to emotions.⁸

There are two accepted screening tools available and validated for Weight Bias Internalization; the Weight Bias Internalization Scale (WBIS) first published in 2008, and the Weight Self-Stigma Questionnaire (WSSQ) first published in 2010. While both will be discussed in the article, the authors here will state they do use and favor the WSSQ. Both are freely available to be adapted for use in clinical practice (EHR, intake paperwork, etc.) provided proper citation and question language. See comparison table below.

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Comparison Table:

Questionnaire	Weight Bias Internalization Scale (WBIS)	Weight Self-Stigma Questionnaire (WSSQ)
First published, Authors	2008, Durso & Latner updated and truncated in 2014	2010, Pearl & Puhl
Response Style	1 to 7 Likert Scale (Strongly Disagree to Strongly Agree)	1 to 5 Likert Scale (Completely Disagree to Completely Agree)
Items/Questions	11 (originally 19)	12
Scoring	Has reverse scoring on questions 1 and 9. The score will be the MEAN. Take the sum which will be between 11 and 77 and divide by 11.	No reverse scoring. Total scores range from 12 to 60; however with 2 distinct subscales. Questions 1 – 6 are totaled as one subscale. Questions 7 -12 are totaled as another subscale.
Interpretation	Low risk tertile: ≤ 3.09 High Risk Tertile ≥ 4.18	Questions 1-6 constitute the Self-Devaluation Subscale Questions 7-12 constitute the Fear of Enacted Stigma Subscale Can help pinpoint whether distress is primarily internal self-blame vs external social dread.
Questions	1. [REVERSE SCORE] Because of my weight, I feel that I am just as competent as anyone. 2. I am less attractive than most other people because of my weight. 3. I feel anxious about being overweight because of what people might think of me. 4. I wish I could drastically change my weight. 5. Whenever I think a lot about my weight, I feel depressed. 6. I hate myself for my weight. 7. My weight is a major way that I judge my value as a person. 8. I don't feel that I deserve to have a really fulfilling social life, because of my weight. 9. [REVERSE SCORE] I am OK being the weight that I am. 10. Because of my weight, I don't feel like my true self. 11. Because of my weight, I don't understand how anyone attractive would want to date me.	1. I'll always go back to being overweight. 2. I caused my weight problems. 3. I feel guilty because of my weight problems. 4. I became overweight because I am a weak person. 5. I would never have any problems with weight if I was stronger. 6. I don't have enough self-control to maintain a healthy weight. 7. I feel insecure about others' opinions of me. 8. People discriminate against me because I've had weight problems. 9. It's difficult for people who haven't had weight problems to relate to me. 10. Others will think I lack self-control because of my weight-problems. 11. People think that I am to blame for my weight problems. 12. Others are ashamed to be around me because of my weight.

Identifying WBI using a screening tool can be an important way to reframe the conversation around weight loss during the visit. Recall that patients already view healthcare providers as the second most common source of stigma. When we ourselves are surveyed, we have reported that we feel treating obesity is professionally unrewarding⁵ while fitness professionals often report that they find weight loss counseling to be professionally gratifying. In the current market, patients take their weight loss care outside of their doctor's office; however, if we do not help address these hindrances, their interventions may only be temporary and exploitative.

The root problem with most weight loss intervention is maintenance due to the fact that after 3 years, most weight is regained.⁸ Properly identifying and then helping patients directly target stigma and coping skills provides them with tools to achieve and maintain weight loss. It is critical to remember that what may be *our first* weight loss conversation with a patient is likely not the *first ever* weight loss conversation with the patient. One study found that patients seeking help from physicians have tried to lose weight an average of 35 times, 5.6 times through a formal weight loss program. 73% reported cycling in weight regularly. As a result of their most recent weight program, 57% of the participants reported losing at least 10% of their body weight; 19% reported losing at least 20%, and 21% reported reaching their goal weight.⁵ But obese patients may have lost weight in avoidant or self-critical ways. That weight loss may have been through severe restriction, denial, suppression, or an unhealthy or unrealistic relationship with food or exercise. Our role in identifying both obesity and WBI is to restructure the way our patient views their condition and their treatments. Using the biopsychosocial model, the treatment of obesity can be viewed through the lens of acceptance and mindfulness.

In 2017, the American Academy of Clinical Endocrinology (AACE) introduced the Adiposity-Based Chronic Disease (ABCD) Model as the diagnostic framework for evaluating and treating obesity.⁹ Using this framework in conversations with patients removes the burden from the scale and places it on health benefit improvements and outcomes. The ABCD model uses concepts we incorporate in other disease states and asks us to treat obesity by assessing for primary, secondary, or tertiary prevention goals to provide complication-centric care. Restructuring the conversation in this way can be a tremendous lift on reducing bias. Patients no longer need to consider weight loss goals in terms of the numbers and beliefs they have held for decades. They no longer need to worry about “target weight,” “goal weight,” “ideal weight,” and BMI categories. Using the ABCD, the physician reviews the comorbid chronic medical conditions the patient has and identifies them. Once identified, the patient and physician can determine a weight loss goal that is a percentage of their total body weight that when lost will have a benefit on the state of their chronic medical condition. The conversation becomes less about losing 20 pounds or dropping 3 BMI points and more about improving hypertension. Patients can gradually begin shifting their view towards healthier choices without guilt, knowing that they are working towards a comprehensive, healthier version of themselves. See Table 2 on page 25 overviewing the ABCD model.

The ABCD model openly acknowledges that obesity is a complex, multifactorial, chronic condition. When individuals attribute the cause of obesity primarily to internal, controllable factors or personal choices, they exhibit a high degree of internal bias. Conversely, when all parties acknowledge the complex causes of obesity, including the elements of genetics, biology, and environment, there is reduced weight bias, blame, and guilt. It is also important to reeducate on dogma that patients have heard on their weight loss journey. Society, media, and even medicine will love to espouse “calories in = calories out,” but it is important that patients hear from their doctors first that this adage is not so simple. Clinical evidence shows that even a 10% weight loss will elicit compensatory change in energy expenditure, decreased metabolic rate, increased hunger, and reduced satiety. Acknowledging these feelings with patients is critical. Patients with WBI will have a poor relationship with food at baseline and be prone to binge eating with poor coping skills. Compounded with the added input of the body attempting to return to its baseline level of excess weight, those cues are a huge uphill battle. If patients can articulate the feelings and triggers they have around food and exercise without shame with their clinician, they are in a better position to receive targeted treatment and therapies to address their concerns. By working towards being mindful about their patterns, i.e. grazing, overeating, compulsive eating, bingeing, etc., they stand a greater chance of success with any and all interventions. Furthermore, when those interventions are weaned or discontinued, they will have made changes that allow for a better relationship with food and exercise so that they are more successful at weight loss and maintenance.

Improving self-acceptance and self-respect will lead to more resilient patients, with the tools to improve their physical activity, exhibit better eating patterns, and be better adherent to their overall care plans and medical regimens.

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Table 2: ABCD Model

Clinical Status / Complication	Intervention / Target Weight Loss	Expected Clinical Outcomes
Primary Prevention		
Primordial Prevention	- Public education - Built environment - Access to healthy foods	Decreased incidence of overweight/obesity in populations
Primary Prevention	- Annual BMI screening - Healthy meal plan - Increased physical activity	Decreased incidence of overweight/obesity in high-risk individuals or identifiable subgroups
Secondary Prevention		
Overweight	- Prevent progressive weight gain or - Weight loss	- Prevent progression to obesity - Prevent development of weight-related complications
Obesity	- Weight loss or - Prevent progressive weight gain	Prevent development of weight-related complications
Tertiary Prevention		
Metabolic syndrome	10% weight loss	Prevention of T2DM
Prediabetes	10% weight loss	Prevention of T2DM
T2DM	5% to $\geq 15\%$ weight loss	- Reduction in A1C - Reduction in number and/or doses of glucose lowering medications
Dyslipidemia	5% to $\geq 15\%$ weight loss	- Lower triglycerides - Higher HDL-c - Lower non-HDL-c
Hypertension	5% to $\geq 15\%$ weight loss	- Lower systolic and diastolic BP - Reductions in number and/or doses of antihypertensive medications
NAFLD: Steatosis	5% or more weight loss	Reduction in intrahepatocellular lipid
NAFLD: Steatohepatitis	10% to 40% weight loss	Reduction in inflammation and fibrosis
Polycystic ovary syndrome	5% to 15% or more weight loss	- Ovulation - Regularization of menses - Reduced hirsutism - Enhanced insulin sensitivity - Reduced serum androgen levels
Female infertility	10% or more weight loss	- Ovulation - Pregnancy
Male hypogonadism	5% to 10% or more weight loss	Increase in serum testosterone
Obstructive sleep apnea	7% to 11% or more weight loss	- Improved symptomatology - Decreased apnea-hypopnea index
Asthma / reactive airway	7% to 8% or more weight loss	- Improvement in forced expiratory volume at 1 second - Improved symptomatology
Osteoarthritis	$\geq 10\%$ weight loss 5% to 10% or more when coupled with exercise	- Improvement in symptomatology - Increased function
Urinary stress incontinence	5% to 10% or more weight loss	Reduced frequency of incontinence episodes
GERD	10% or more weight loss	Reduced symptom frequency and severity
Depression	Uncertain	- Reduction in depression symptomatology - Improvement in depression scores

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Preserving Muscle Mass in the Era of Modern Pharmacotherapy: A Sports and Obesity Medicine Perspective

By Christine Persaud, MD, MBA; Ahmed Ashai, MD; Patrick Cleary, DO and Laurenie Louissaint, MD, MS

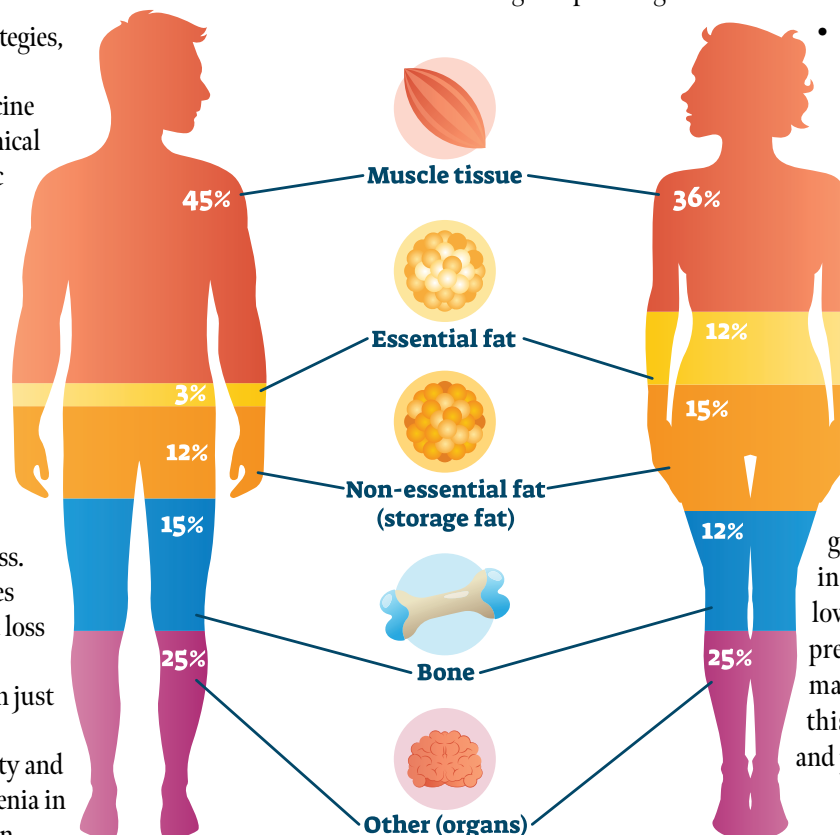
The rapid expansion of obesity pharmacotherapy including glucagon-like peptide-1 (GLP-1) receptor agonists, dual incretin agents, and established oral regimens such as naltrexone-bupropion and phentermine-topiramate has transformed obesity management in primary care. As these medications become cornerstone treatments, family physicians are uniquely positioned to serve as the primary coordinators of metabolic health. However, a critical clinical challenge persists across all intensive weight loss modalities: the significant loss of lean body mass. This loss carries profound implications for metabolic rate, physical function, and injury risk, areas central to the comprehensive, longitudinal scope of family medicine. This review study offers an evidence based framework through the dual lens of sports and obesity medicine, emphasizing the preservation of skeletal muscle as a vital clinical outcome. It reviews body composition changes associated with both incretin based therapies and oral combinations. To mitigate muscle attrition, the article details dietary recommendations as well as specific resistance training prescriptions adaptable for primary care. This includes the strategic use of isometric exercises for joint loading and stability, concentric contractions for metabolic efficiency, and eccentric loading for maximizing muscle hypertrophy and structural resilience.

By integrating these strategies, this perspective seeks to revolutionize family medicine practice by shifting the clinical focus from a weight centric model to a function and longevity centric one. This information will empower family physicians to transition beyond simply monitoring the scale, instead utilizing performance based metrics and body composition as the definitive markers of success. This paradigm shift ensures that pharmacologic weight loss results in a healthier, more resilient patient rather than just a smaller one, ultimately improving long term vitality and reducing the risk of sarcopenia in the primary care population.

1. Concerns with Sarcopenia and Lean Mass Loss: Pathophysiology vs. Hypocaloric Malnutrition

While total body weight reduction yields undeniable cardiovascular and metabolic benefits, the unintentional depletion of lean muscle mass remains a primary clinical hurdle. Clinical trial data across the STEP (semaglutide) and SURMOUNT (tirzepatide) programs reveal that 15% to 40% of total weight loss stems from lean mass.¹ This phenomenon introduces severe physiological and structural vulnerabilities:

- **Sarcopenic Obesity:** Accelerated lean mass loss while maintaining relatively high fat-mass ratios can inadvertently induce or worsen sarcopenic obesity. This is highly prevalent and dangerous in older, frail, or sedentary adults who already exhibit diminished baseline muscular reserves.
- **Metabolic Downregulation:** Skeletal muscle serves as the primary anatomical site for insulin-mediated glucose disposal and resting metabolic rate (RMR) regulation. Severe catabolism of lean mass drives down baseline energy expenditure, compounding the metabolic plateau and increasing the probability of rapid weight regain upon drug cessation or dose tapering.



- **Functional Decline:** Diminished muscle mass directly compromises force generating capacity. Patients experience diminished grip strength, impaired mobility, reduced physical endurance, and an elevated baseline risk for falls and functional dependence.
- **Longevity Decrease:** Leg strength is a primary indicator of longevity and healthy aging. While leg and grip strength serve as primary indicators of healthy aging and lower all-cause mortality, preserving under-lying muscle mass is critical to sustaining this force-generating capacity and preventing clinical sarcopenia.²

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Resolving the Pathophysiological Paradox

Crucially, emerging scientific consensus indicates that GLP-1 receptor agonists are not intrinsically toxic to skeletal muscle; rather, they present direct and indirect muscle-preserving properties.³ Preclinical and systematic review data demonstrate that GLP-1 RAs act as positive modulators of tissue integrity through several homeostatic mechanisms:

- **Anabolic Signaling Activation:** Upregulation of the PI3K/Akt/mTOR pathway and promotion of myogenic differentiation.
- **Metabolic Support:** Activation of the AMPK-PGC-1 α pathway to improve mitochondrial efficiency and reduce intracellular oxidative stress.
- **Anti-proteolytic Activity:** Attenuation of inflammatory cytokines and suppression of systemic muscle wasting cascades.⁴

The muscle wasting observed clinically is possibly driven by behavioral and secondary nutritional factors, specifically, the severe reduction in protein and overall caloric consumption caused by profound central satiety and delayed gastric emptying. While preclinical studies suggest GLP-1's physiological footprint is muscle protective, no finite clinical conclusion can be drawn. Clinical interventions targeting protein delivery and mechanical loading are highly effective at isolating adipose tissue catabolism while shielding lean mass.

2. Osteoporosis and Incretin Therapies (GLP-1 RAs)

Intensive weight loss is characteristically associated with a concomitant drop in bone mineral density (BMD), triggered by mechanical unloading of the skeleton and shifts in bone regulating hormones. For family physicians managing obesity, protecting the musculoskeletal axis requires understanding the complex interplay between weight loss and bone metabolism:

- **Bone Turnover and Mechanical Unloading:** Rapid adipose tissue loss unloads skeletal architecture, accelerating bone resorption.
- **Clinical Trial Evidence:** Secondary analyses of high-impact randomized controlled trials provide essential guidance. Studies demonstrate that GLP-1 receptor agonist therapy alone can reduce bone mass at critical load-bearing anatomical sites, including the femoral neck and total hip.⁵
- **The Mitigating Role of Exercise:** Strikingly, combined treatment involving structured, vigorous exercise alongside a GLP-1 RA prevents this loss. Active exercise preserves bone mineral density and keeps bone turnover markers balanced, demonstrating that mechanical loading can offset the osteoporotic risks linked to pharmacologic weight loss.⁶

3. The GLP Diet and Adequate Protein Guidelines

The severe appetite suppression, delayed gastric emptying, and altered food reward preferences induced by GLP-1 and dual GLP-1/GIP therapies frequently culminate in erratic eating patterns and unintended protein malnutrition. To counter this, joint clinical consensus from major metabolic and nutritional societies such as

the American College of Lifestyle Medicine (ACLM), American Society for Nutrition (ASN), Obesity Medicine Association (OMA), and The Obesity Society (TOS) emphasize strict, structured nutritional interventions:

Adequate Protein Intake

During active, medication induced caloric restriction, baseline protein recommendations must be elevated above normal maintenance levels to defend skeletal muscle.

- **Target:** A daily protein intake of 1.2 to 1.5 grams per kilogram of total body weight is strongly recommended, scaling up to 1.5 to 2.0 g/kg of ideal body weight for highly active individuals or those at severe risk for sarcopenia.⁷
- **Distribution:** This protein should be distributed evenly across 3 to 4 meals (approximately 25–40g per meal) to maximize muscle protein synthesis via regular stimulation of the mammalian target of rapamycin (mTOR) pathway. This ensures that the protein intake is actually utilized, as very high levels of protein taken in a single sitting may not be fully optimized for muscle protein synthesis. While historical data suggested a strict per meal saturable threshold of 20–30g for muscle protein synthesis, modern kinetic modeling indicates that larger protein boluses sustain whole body net protein balance and muscle anabolism over extended postprandial windows without a definitive upper limit.⁸ Even distribution (25–40g per meal) remains a practical strategy to manage early satiety on GLP-1 therapies.

Comprehensive Dietary Recommendations

- **High-Quality, Lean Proteins:** Focus on poultry, lean beef, fish, eggs, tofu, Greek yogurt, and whey/plant protein supplements if early satiety impairs solid food consumption.
- **Micronutrient Fortification:** Due to low overall food volume, prioritize calcium (1,000–1,200 mg/day) and Vitamin D3 (minimum 1,000–2,000 IU/day) to maintain bone architecture.
- **Hydration & Fiber:** Slower GI transit requires ample water intake and a high reliance on soluble and insoluble fiber (25–35g daily) from vegetables and whole grains to stave off severe constipation.

4. Exercise Prescriptions to Preserve Muscle Mass

To prevent the scale from reflecting structural muscle decay, primary care providers must write explicit exercise prescriptions that leverage the distinct biomechanical profiles of muscle contractions:

Isometric Contractions (Static Loading)

- **Mechanism & Use:** Involves muscle activation without changes in muscle length or joint angle. It is an excellent starting point for deconditioned or arthritic patients.
- **Prescription:** Wall sits, planks, and static glute bridges. These provide localized joint loading, enhance core stability, and increase neuromuscular recruitment safely.⁹

Concentric Contractions (Metabolic Efficiency)

- **Mechanism & Use:** Involves the shortening of a muscle against resistance (e.g., the upward phase of a bicep curl or standing up from a chair).

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- **Prescription:** Regular movement patterns like standard body-weight squats, chest presses, or row variations. Concentric actions optimize acute glucose disposal, stimulate immediate metabolic activity, and restore daily functional movement patterns.⁹

Eccentric Contractions (Structural Resilience & Hypertrophy)

- **Mechanism & Use:** Involves muscle lengthening under tension (e.g., the controlled lowering phase of a squat or step-down). Eccentric loading causes microdamage within myofibrils, triggering robust satellite cell activation and subsequent muscle hypertrophy.
- **Prescription:** 3 to 4 second slow lowering phases during squats, controlled step-downs, and Romanian deadlifts. This modality is highly effective at preserving lean mass and enhancing tendon resiliency under caloric deficits.¹¹

Patient resource for videos of exercises listed: American Council on Exercise (ACE) Exercise Library

5. Comparative Overview of Weight Loss Interventions and Pharmacotherapies

Different pharmacological approaches and therapeutic modalities display markedly unique profiles regarding total weight reduction and corresponding lean mass outcomes. The following data synthesizes recent clinical and comparative evidence:¹²

Emerging Pipeline Opportunities

Note: The following segment covers future pipeline concepts strictly and is not currently recommended for primary care clinical practice.

Recognizing the limitations of current guidelines that focus narrowly on the scale rather than body composition, the pharmaceutical pipeline is adapting. Therapeutics designed to be administered alongside GLP-1 receptor agonists are currently in clinical development to target muscle mass regulatory pathways directly:¹³

- **Myostatin-Targeting TGF-β Inhibitors:** These agents (such as apitegromab or bimagrumab variations) block myostatin, a negative regulator of muscle growth, explicitly stimulating muscle hypertrophy even in a caloric deficit.¹³
- **Selective Androgen Receptor Modulators (SARMs):** Designed to provide tissue-selective anabolic support to skeletal muscle and bone while avoiding the systemic side effects of traditional anabolic steroids.¹³

Until these pipeline therapies achieve widespread clinical approval, the responsibility rests on family physicians to enforce structural safeguards, specifically elevated protein consumption and a dedicated triad of isometric, concentric, and eccentric resistance exercises, ensuring that modern weight loss yields functional vitality rather than structural frailty.

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Pharmacotherapy / Interventions	Average Total Weight Loss (%)	Estimated Lean Mass Loss (% of Total Loss)	Primary Clinical Mechanism Affecting Muscle
Phentermine-Topiramate	~8% – 10%	~20% – 25%	Sympathomimetic appetite suppression; general caloric deficit without direct muscle protection.
Naltrexone-Bupropion	~5% – 7%	~20% – 25%	Hypothalamic/reward pathway suppression of appetite; standard catabolic lean loss.
Semaglutide (GLP-1 RA) Without Intervention	~15%	~35% – 40%	Profound central appetite suppression leading to hypocaloric protein deficiency; overrides intrinsic peptide muscle-protective pathways.
Semaglutide + Exercise & Protein	~12% – 15%	Dropped to <10% – 15%	Nutritional repletion satisfies anabolic thresholds; structured mechanical loading synergy optimizes tissue retention.
Tirzepatide (Dual GLP-1/GIP)	~20% – 22%	~30% – 35%	Enhanced dual incretin metabolic clearance; rapid tissue unburdening requires immediate nutritional and resistance-training mitigation.
Bariatric Surgery	~25% – 30%	~25% – 35%	Severe anatomical restriction and malabsorption; demonstrates lean to fat loss dynamics highly comparable to modern medical options.

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“Obese or Rubenesque?” Optimizing Clinical Observation and Public Health Perspective Through the Medical Humanities

By Lewis Wong, MD, DMA, MM and Kristy Lamb, PhD

Reframing the Clinical Gaze: From Pathology to Presence

Obesity is universally acknowledged as a growing and significant public health challenge for health systems in New York and across the United States. Similarly, it is well-established in the medical community that the stigmatization of patients with obesity leads to worse outcomes, poor quality of care, and impaired doctor-patient relationships. One recent study noted that patients with elevated BMIs may “avoid care or switch doctors as a result of stigmatizing experiences and poor communication with doctors. These outcomes may contribute to morbidity in people with obesity if they delay or avoid care for health concerns when symptoms first present.”¹ While the literature associated with the harms caused by this stigma is extensive, the tools that are available to address such harms are inadequate. They tend to rely on broad, non-clinical “body positivity” themes that are met with skepticism by both the medical and non-medical communities alike.

This is why clinicians are often hesitant to adopt these updated mindsets; they are generally perceived as out of step with the rigorous, evidence-based culture of medicine. The reluctance likely stems from the discrepancy between cultural body-positivity narratives and the cold clinical reality that progressive adiposity is associated with an increase in chronic disease. Bombak² writes that current individual and environmental approaches to obesity treatment have been stymied by a limited evidence base and ethical difficulties that prioritize weight loss as the primary goal as opposed to primary prevention. Additionally, as Bombak’s described initiatives do not challenge the tendency to moralize body weight, clinicians lack a cognitive bridge; there is no way to mentally reframe how to interact with larger bodied patients without creating a disconnect with their clinical judgement. Furthermore, if the healthcare system maintains a pervasive focus on individual blame in weight management, it risks further alienating large segments of the population. This would make it impossible for the system to reach broad population health goals.³



To move beyond this impasse, the authors propose an alternative framework rooted in a longstanding historical precedent: reframing the clinical gaze in the Rubenesque tradition.

For four hundred years, this artistic lens has recognized large bodies not as inherently “lazy” or “indolent,” but as symbols of vitality, strength, and presence. In art history, the Rubenesque form is a seminal example of a cultural paradigm where fleshliness is not a sign of moral failure but an affirmation of life, energy, and material presence, effectively resisting the modern impulse to reduce the human form to a static, pathological metric.⁴

By encouraging the integration of this perspective into family medicine, the authors are not attempting to replace clinical diagnoses with aesthetic ones,

nor are we calling for the abandonment of dietary guidelines. Rather, we see this reframing as a useful and necessary tool for the practitioner. By training clinicians to consciously adopt a “Rubenesque gaze”—viewing the patient’s humanity and vitality before engaging with their BMI—we can disrupt implicit bias at first sight. This reframing allows the physician to decouple a patient’s physical size from the judgment that inevitably undermines the therapeutic relationship. By integrating art-historical visual literacy into our practice, we can strip away centuries of inherited bias, restore patient dignity, and ensure that our clinical counsel is delivered with the objectivity and respect that every patient deserves.

Visual Literacy: A Bedside Tool for the Exam Room

In medical training, clinicians are taught to look, but rarely are they taught to *see*. After thousands of exams, practitioners may enter the examination room with the electronic medical record (EMR) already open in their minds—a pre-populated grid of body mass index (BMI) percentiles and comorbidity checklists that effectively serves as a cognitive filter. By the time they encounter the patient face-to-face, they are verifying a pathology in physical form rather than examining a whole fellow human. This diagnostic tunnel vision can build a self-reinforcing pathway where physical examination habits atrophy and passive assumptions replace rigorous bedside inspection.⁵

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To help counteract this, primary care providers can adopt a “Visual Literacy” protocol—a technique rooted in the same observational rigor used in art history to analyze a complex canvas. “Visual literacy” in medicine represents the capacity to reason physiological and pathophysiological states from careful, systematic, and unbiased observation.⁵ Before engaging with the digital chart or initiating historical triage, clinicians can perform a 30-second sensory pause. This is not wasted clinical time; it is a structured behavioral intervention designed to bypass the automatic cognitive shortcuts that trigger implicit weight bias.

The 30-Second Observation Protocol

This method adapts the foundational Visual Thinking Strategies (VTS) framework, which has been formally operationalized within medical education to enhance diagnostic acumen and systematically counter cognitive shortcuts in all areas of clinical practice.^{5,6} Rather than rushing to form an immediate diagnostic label, the clinician remains standing for thirty seconds upon entry, applying three distinct observational steps before sitting at the workstation:

- **Step 1: Notice Movement, Not Mass.** Observe how the patient occupies space, enters the room, or shifts posture on the examination table. Note whether they move with functional ease or if there is mechanical guarding or hesitation. By focusing strictly on objective physical mechanics over subjective size constructs, clinicians significantly reduce their reliance on broad, unhelpful clinical labels like “healthy” or “unhealthy.”⁷
- **Step 2: Identify One Sign of Vitality.** Scan the patient for a concrete visual marker of life that exists independently of their metabolic charting. This includes observing facial symmetry, the character of their eye contact, skin perfusion, or the specific cadence of their unlabored breathing. This intentional tracking broadens the clinician’s interpretive scope, helping them recognize the patient’s emotional state and immediate environment rather than reducing them to an isolated medical condition.⁷
- **Step 3: Reframe Your Opening.** Use these data-driven visual observations to ground the initial clinical inquiry. If you notice a patient seems fatigued, address their energy baseline; if you observe a particular strength or comfort in their posture, build your therapeutic alliance around that functionality.

Clinical Language Shift: From Weight to Well-Being

Formal training in visual arts curricula demonstrates that structured observation helps clinicians expand their descriptive precision, minimize subjective bias, and sit comfortably with clinical ambiguity.^{6,7} When a physician begins the patient encounter by immediately referencing weight, the body is framed as a failure to be corrected. If the opening dialogue centers on function, the body is framed as an instrument to be supported. By committing to this 30-second pause, the physician engages in active visual de-biasing. This protocol forces the clinician to observe, analyze, and collaborate with the presentation in front of them before allowing the pathology in the chart to dictate the diagnostic relationship.⁶ It transitions the exam room from a site of passive measurement to a canvas of deliberate clinical insight.

Clinical Case Applications: Applying the Protocol Across the Lifespan

The Radiant Subject: Venus and Adonis — Addressing Implicit Bias to Prevent Future Care Avoidance



In Rubens’s Venus and Adonis, the viewer instantly feels a dramatic tension between the goddess, who begs for presence, and the hunter, who is looking past her towards a distant target. In this painting, Venus is not only the most prominently central figure on

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If you find yourself thinking...	Instead, try this opening...	Why it works
“Their BMI is too high; we need to talk about calorie restriction.”	“How has your body felt when you’re active lately? What’s one movement that gives you joy?”	Prioritizes patient autonomy and intrinsic motivation over external BMI targets.
“They aren’t losing weight; they aren’t trying hard enough.”	“What’s one thing about your health that you wish doctors better understood about how your body works?”	Validates the patient’s lived experience and acknowledges the complexity of their health history.
“I need to lecture them on their diet because of their weight.”	“What is the biggest barrier you’re facing in feeling strong and comfortable in your day-to-day life?”	Moves the conversation from a moral critique of lifestyle to a collaborative identification of obstacles.

the canvas, she is also rendered in light hues of “pantachromic tone,” described by controversial art historian Hans Sedlmayr⁸ as not a bland whitish beige, but rather a mixture that contains all colors in totality. This further cements her place as the subject, rather than the object of Rubens’s perspective.

In the same way, when an adult woman who is living with obesity enters the clinical exam room, her viewpoint should be the focus of the encounter. However, she often faces a physician who has unconsciously adopted the same “hunter’s gaze;” this is problematic as while the clinician’s intent may be that of diagnostic focus, the outward manifestation of this focus is often that of judgment, and it additionally creates a secondary fear in the patient that she is just a bystander in a “hunt” rather than an individual being cared for. This fear, as Malterud and Ulriksen note,⁹ creates a stigmatizing environment that obstructs therapeutic collaboration.

Furthermore, if there is systemic alienation on the health systems level, secondary prevention deficits will likely occur. Critical screenings such as Pap smears and mammograms could decrease on the population level.¹⁰

Overall, the misplaced gaze has historically driven patients to avoid future preventive care. Reframing the view from the lens of Rubens’s painting can help address this bias, by helping the clinician take Venus’s vantage point rather than Adonis’s so that the female subject is not merely an allegory of objectification or irrelevance, but rather a complete individual with their own personhood. This is the only way to ensure the clinical space remains a safe sanctuary for women’s health.

Applying the 30-Second Pause:

Notice movement, not mass: Observe her baseline positioning on the exam table or chair. Note whether she exhibits protective posturing, mechanical guarding, or physical hesitation—subtle indicators that she may be bracing for the typical judgment or clinical shaming experienced in past encounters.

Identify one sign of personal presence: Actively look for a marker of her individual identity or emotional state that completely transcends her physical dimensions or chart notes. This means focusing on the nuance of her expression, the tone of her greeting, or the specific environment she creates in the room, forcing your brain to recognize her as a complete person before you open the digital record.

Reframe your opening: Prioritize her immediate psychological safety and agency over routine intake boxes. Ground your first question in her presence rather than her pathology by asking, “What can we focus on today to make sure this visit feels entirely supportive and valuable to you?”

The Parents and their Child: Rubens, Helena Fourment, and Their Son Frans — Facilitating Functional Development in Pediatric Obesity



In his tender portrait Rubens, Helena Fourment, and Their Son Frans, the artist depicts his child as a pleasingly plump toddler. Here, the child’s shape is shown as a sign of vigorous, thriving health, rather than a badge of illness. Using chiaroscuro,¹¹ Rubens draws the eye away from the darkly clothed parents to their son, whose bright attire frames his ruddy, cherubic face. The soft, rounded contours of the boy’s limbs extend into outstretched hands reaching for his mother as she simultaneously pulls him toward her by a leading string. This stands in sharp contrast with how clinicians often view a child with an elevated BMI in an exam room setting. Note that while generally discussing clinical metrics with parents does not directly alter a child’s physiological or psychological development, the area of concern may appear in the downstream effects. When healthcare communication centers on a punitive metric, it often triggers parental hyper-monitoring and rigid restrictions at home. This is what can lead to the inadvertent erosion of the child’s confidence and willingness to engage in spontaneous play. From a public health perspective, deficit-centered communication alters the family micro-environment. The research shows that this increases the long-term risk of physical inactivity and disordered eating as children grow into adolescents and beyond.¹² Consequently, the American Academy of Pediatrics (AAP) guidelines emphasize a shift in obesity care toward family-centered, individualized treatment. This prioritizes a supportive, positive environment rather than deficit-based weight-loss mandates.¹²

The Rubens portrait offers a visual model for this very shift. Viewing the pediatric patient through that lens protects the clinical space from becoming an incubator for parental hyper-surveillance. Rather than mandating numeric “correction,” the physician celebrates functional vitality, actively de-escalating parental panic. This replaces a home environment of rigid policing—a tightening of the parental “lead string” that chokes off spontaneous play—with a collaborative framework that preserves the child’s autonomy and ensures their ongoing joy of movement. Ultimately, that autonomous drive fosters more consistent, self-initiated physical activity, which provides a far more sustainable foundation for long-term weight management than any tightened leash ever could.

Applying the 30-Second Pause:

Notice movement, not mass: Watch how the child organically explores the room, handles a toy, or climbs onto the examination table. Pay attention to their natural, uninhibited physical mechanics and how comfortably they occupy the clinical space rather than focusing on how their mass fits a percentile curve.

Identify one sign of the parent-child relational dynamic: Observe the interaction between the parent and the child. Look for whether the parent is already exhibiting anxious vigilance over the child's posture and behavior, or if there is a supportive baseline you can leverage to de-escalate clinical panic. Reframe your opening: Pivot the conversation completely away from the electronic health record's growth charts to model a non-punitive approach for the parent. Address them both by asking, "What are the activities your child completely lights up doing, and how can we work together to give them more opportunities to lead the way in that play?" This immediately grounds the take-home lesson in protecting autonomy over enforcing restrictions.



**The Complexity of Age:
The March of Silenus —
Prioritizing Structural
Stability Over Metabolic
Metrics in Geriatric Care**

The March of Silenus, a woodcut created by Rubens's close collaborator, Christoffel Jegher (based on the master's original design), offers a visual template to translate the tenets of the Rubenesque tradition into a new geriatric clinical gaze designed to dismantle weight stigma. Jegher builds the central figure's robust form through expert command of the carved line. Long, swelling contour strokes give the torso a powerful gravitational presence. Then dense cross-hatching grounds the form with a clear sense of material heft. A master printmaker, Jegher condenses the environment as well; he strips away all architectural, landscape, and narrative framing, leaving only the body and the terrain. In this way, the composition forces an unmediated encounter with a form understood not through bulk as spectacle, but through the kinetic reality of mass moving across space. The woodcut also has a dynamic strength embodied in the actions of Silenus's companions, who turn the focus away from weight and toward the immediate biomechanics—supporting his torso, bracing his stride, and anticipating his center of gravity to prevent a catastrophic fall.

Translating this supportive, non-judgmental stance into modern geriatric practice provides the exact interpretive framework needed to correct decades

of reductive clinical training. For years, traditional clinical training associated geriatric frailty with cachectic, underweight elders, driving physicians to overlook the structural vulnerabilities of older adults with elevated BMIs. Furthermore, within the geriatric examination room, implicit weight bias often manifests as a form of therapeutic nihilism, where an older patient's mobility limitations are seen as physical indolence rather than a challenge that profoundly affects the patient's life.

Adopting this Rubenesque perspective corrects this oversight by aligning clinical practice with modern epidemiology. While research by Yu and Meng¹³ establishes sarcopenic obesity as a critical, independent risk factor for gait instability and falls, a standard metabolic lens often induces clinicians to recommend restrictive diets for more effective weight loss. However, as Arslan and Aydin¹⁴ demonstrate, aggressive weight loss without concurrent strength preservation inadvertently accelerates muscle loss, exacerbating the very instability clinicians seek to mitigate. Prioritizing muscle preservation and gait stability over weight loss also allows clinicians to address the public health aspect of this issue. This change in focus directly affects the metric of fall-related injuries, which continue to be an important driver of premature institutionalization and increasing Medicare costs.¹⁵

By addressing this clinical contradiction, the Rubenesque framework trains the physician to look at the patient not as another case of BMI failure, but rather as a complex biomechanical structure requiring stability. This ensures that interventions prioritize functional independence and fall prevention over numbers.

Applying the 30-Second Pause:

Notice movement, not mass: Strictly observe their immediate biomechanics as they navigate the space. Watch their gait transition from the doorway to the examination chair: do they rely on a wider base of support, or do they exhibit mechanical guarding, shortened stride length, or hesitation?

Identify one sign of structural compensation: Scan for a concrete physical marker of how their body is actively managing its mass against gravity. This includes noting their use of environmental assists (e.g., bracing against a table or door frame), their degree of truncal sway, or how heavily they rely on momentum to stand or sit.

Reframe your opening: Address their immediate structural vulnerability rather than their metabolic charting by asking, “I noticed you were very deliberate when stepping up onto the platform; how has your balance been feeling at home lately?”

Conclusion: Beyond the Metric

Looking is a reflex, but seeing is a process that requires deliberate clinical discipline. The authors are not proposing a lens in the Rubenesque tradition in order to abandon an evidence-based approach. Instead, we are advocating for cognitive bridging that decouples a patient's material volume from reflexive biases that harm the patient-physician relationship. Using the 30-second pause will prevent cognitive shortcuts; this allows a patient to go from an abstract pathology in an exam room to a real, complete human being. Furthermore, shifting the clinical gaze is useful across the lifespan of patients, making it a true family medicine tool and an effective public health intervention. In women's care, rejecting the judgment of the “hunter's gaze” makes the clinic a sanctuary; patients here will feel encouraged to engage in further preventive care. In the pediatric setting, replacing the rigid numbers with activity and functional vitality de-escalates parental panic; children's home environments can then foster autonomous movement rather than body policing. Finally, in geriatric care, moving past the traditional metabolic lens lets the physician prioritize structural vulnerabilities; aligning medical interventions with the epidemiological realities of sarcopenic obesity means that the patient's mobility will be prioritized over irrelevant milestones. Ultimately, integrating art-historical visual literacy into primary care achieves what metric-focused mandates cannot: it strips away the moralizing lens of weight stigma and restores clinical counsel to what it was always intended to be—a supportive instrument designed to help the human form move safely, dynamically, and with dignity through the world

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The Silent Contributor: A Review of Prescription Medications Associated with Iatrogenic Weight Gain

By Sophia Venero, MD; Jeffrey Ta, MD; Kainat Meer, DO; Lovedhi Aggarwal, MD and Ghazal Sinha, MD, DABOM, MSCP

Obesity is one of the most pressing public health challenges facing the United States, with prevalence rising markedly over decades. Obesity, defined as a body mass index (BMI) of ≥ 30 kg/m², is calculated as weight in kilograms divided by height in meters squared. It is further classified into class I (BMI 30–34.9), class II (BMI 35–39.9), and class III (BMI ≥ 40) obesity.¹ In 1990, the adult obesity rate among the US adult population stood at 19.3%; by 2022, this figure had climbed to 42.5%, and projections estimate a further increase to 46.9% by 2035.² In New York State, obesity prevalence has been on the rise, from 26.3% in 2020 to 29.5% in 2024.³

The obesity epidemic is multifactorial, driven by environmental, psychosocial, and genetic factors. While weight loss medications such as semaglutide and tirzepatide have shown promise in reducing obesity-related comorbidities, an often overlooked contributor is medication-induced weight gain. **Commonly prescribed medications associated with weight gain include antihyperglycemics, antidepressants, antipsychotics, antiepileptics, corticosteroids, and β -blockers.** On average, these medications can result in weight gain ranging from 0.8 kg to 7.7 kg, depending on the agent, dose, and duration of therapy.⁴ Medication-induced weight gain frequently exacerbates metabolic dysfunction, thereby elevating cardiovascular risk and associated comorbidities. Consequently, primary care clinicians play a pivotal role in identifying and managing obesogenic medications to help mitigate the broader obesity epidemic.

Antipsychotics, particularly quetiapine and olanzapine, are well recognized for their propensity to promote weight gain. Proposed mechanisms include antagonism of histamine H1 and serotonin 5-HT_{2C} receptors, dopamine D₂ receptor blockade, and disruption of hypothalamic pathways involved in appetite regulation.^{5–7} These effects impair normal satiety signaling and may lead to increased caloric intake and progressive weight gain. A 2025 meta-analysis examining low-dose quetiapine (< 200 mg), commonly used off-label for insomnia or anxiety,

found that quetiapine at this low dose was associated with significant weight gain (mean difference 0.58 kg vs placebo).⁷ Patients receiving quetiapine were more than twice as likely to experience $\geq 7\%$ increases in baseline body weight.⁸ The effect is also significant on pediatric populations, with quetiapine associated with a mean weight gain of 5.84 kg at 6 months and BMI increases of 1.5–1.82 units. Olanzapine has been shown to cause the greatest weight gain in youth, with increases of up to 10.91 kg at 6 months.⁹

Similarly, **antidepressants**—commonly used to treat depression, anxiety, and obsessive-compulsive disorder—are also associated with weight gain. Mirtazapine promotes weight gain through mechanisms similar to antipsychotics, including histamine H₁ and serotonin 5-HT_{2C} receptor antagonism.^{6,10} In controlled trials, 17% of patients reported increased appetite, and 7.5% experienced $\geq 7\%$ weight gain compared to 0% in placebo groups.¹⁰ A network meta-analysis found that, at 6 months, duloxetine, escitalopram, and paroxetine were associated with a 10–15% increased risk of $\geq 5\%$ body weight gain compared to sertraline.¹¹ Differences in weight effects among antidepressants have important prescribing implications. Tricyclic antidepressants generally produce greater weight gain than selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs), whereas bupropion remains a favorable option in patients where weight reduction or weight neutrality is a treatment priority. See Figure 1 on page 37.

Antihyperglycemic agents are also well known to contribute to weight gain. Patients treated with insulin can gain up to 10 kg.¹² Insulin promotes weight gain through multiple mechanisms, including increased glucose uptake in peripheral tissues, decreased hepatic glucose production, and overall anabolic effects.¹³ It also influences central appetite regulation through hypothalamic pathways.¹⁴ In populations where weight gain is a concern, it may be beneficial to consider combining insulin therapy with weight-neutral or weight-reducing agents such as metformin, GLP-1 receptor agonists, or SGLT2 inhibitors.¹⁵ Pioglitazone, an insulin sensitizer that acts via peroxisome



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proliferator-activated receptor gamma (PPAR- γ) activation, has also been shown to contribute to weight gain. The ACT NOW trial demonstrated an average weight gain of approximately 3.9 kg compared to placebo.¹⁶ According to the American Diabetes Association, metformin, GLP-1 receptor agonists, and SGLT2 inhibitors are preferred therapies for type 2 diabetes especially in patients with obesity.²⁴

Antiepileptics such as gabapentin is commonly prescribed for the treatment of neuropathies. Several studies have suggested that gabapentin may contribute to weight gain through alterations in gastrointestinal function and enhanced GABA-mediated neurotransmission, which can affect appetite and energy expenditure, ultimately leading to metabolic changes.^{17,18} In one study of patients taking gabapentin for 12 months or longer, 57% gained more than 5% of their baseline body weight, while 23% gained more than 10%.¹⁹ In comparison, duloxetine remains a reasonable choice for diabetic neuropathy in obese patients given the neutral to modest weight gain compared to gabapentin.²⁵

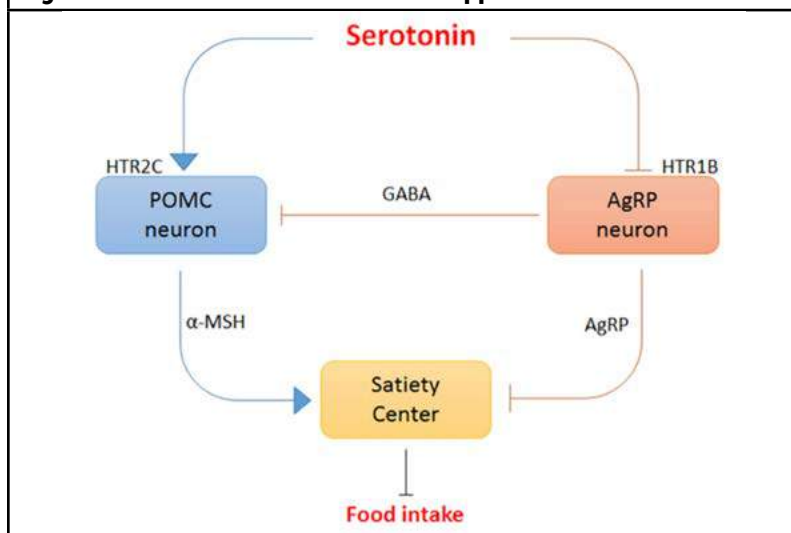
Beta-blockers such as metoprolol and propranolol are also associated with weight gain. Compared with ACE inhibitors, metoprolol has been shown to cause approximately 1.2–1.7 kg of weight gain over 12 months.²⁰ Beta-blockers contribute to weight gain by reducing energy expenditure, lowering basal metabolic rate, decreasing fat oxidation, and suppressing diet-induced thermogenesis by up to 50%. They may also worsen insulin resistance, increasing the risk of type 2 diabetes.^{21,22} The GEMINI trial (JAMA, 2004) compared carvedilol with metoprolol tartrate in patients with hypertension and type 2 diabetes and found that patients taking metoprolol gained an average of 1.19 kg, whereas carvedilol was not associated with significant weight gain.²³ Given these metabolic effects, ACE inhibitors, ARBs, or calcium channel blockers are often preferred over beta-blockers as first-line antihypertensive therapy in patients with type 2 diabetes.

Corticosteroids remain another important source of iatrogenic weight gain. Prolonged steroid use, particularly for longer than three months at doses exceeding 5 mg/day—has been associated with significant weight gain.²⁶ They contribute to weight gain through several mechanisms, including increased central appetite stimulation, enhanced hepatic gluconeogenesis leading to insulin resistance, visceral fat accumulation, and broader metabolic dysregulation.²⁷ Chronic corticosteroid therapy has been shown to increase body weight by approximately 4–8%.²⁸ These risks underscore the importance of limiting long-term corticosteroid exposure whenever possible and carefully weighing metabolic consequences against therapeutic benefit.

Medication-induced weight gain is an often-overlooked contributor to the obesity epidemic. Numerous medications across a variety of classes—including antipsychotics, antidepressants, beta-blockers, insulin, corticosteroids,

anticonvulsants, and others, may promote weight gain and unintentionally worsen metabolic outcomes. When appropriate, clinicians should consider alternative medications that are weight-neutral or may even promote weight loss in select patient populations. Shared decision-making is essential when discussing treatment options and the potential for medication-associated weight gain. If weight-promoting medications are clinically indicated or alternative therapies are unsuccessful, management of the underlying disease should take precedence. Modifications to such therapies initiated by another clinician should ideally occur through coordinated interdisciplinary decision-making to avoid unintended clinical destabilization. Ultimately, the goal is to optimize patient health by balancing psychiatric or physical stabilization with long-term metabolic health.²⁹ See Figure 2, pages 38–39, for an overview of drug class type and alternative drugs.

Figure 1: Serotonin and its effects on appetite³⁰



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Figure 2: Drug Class/Type and Alternative Drugs³¹

Drug Class/Type (and Potential Related Weight Gain)	Common Name	Proprietary or Brand Name	Alternative Drugs (Weight neutral or may promote weight-loss)
Diabetes Therapies (may cause up to 8 kg weight gain in an intensive 3-month treatment course)			
Insulin	insulin lispro insulin aspart insulin glulisine	Humalog® Novolog® Apidra®	metformin (Glucophage®, Glucophage® XR, Fortamet®, Glumetza®, Riomet®, generics)
Thiazolidinediones (TZDs)	pioglitazone	Actos®	Linagliptin (Tradjenta®) saxagliptin (Onglyza®) sitagliptin (Januvia®) exenatide(Byetta®) Liraglutide (Victoza®) acarbose (Prandase®, Precose®) miglitol (Glyset®)
Sulfonylureas (SUs) <i>usually ≤5 kg gain during 3-12 months of treatment</i>	glipizide glyburide glimepiride chlorpropamide tolbutamide	Glucotrol® Glucotrol® XL Diabeta® Micronase® Glynase® Amaryl® Diabinese® generics	<i>These combination products tend to have fewer side-effects and less weight gain:</i> metformin/pioglitazone (Actoplus Met®) glipizide/metformin (Metaglip®) glyburide/metformin (Glucovance®) glimepiride
Psychiatric/Neurologic Therapies			
Tricyclic Antidepressants <i>General gains of 0.4 to 4.12 kg/month minority of pa-tients gain 15 to 20 kg in 2 to 6 months</i>	amitriptyline doxepin imipramine nortriptyline trimipramine mirtazapine	Elavil® Endep® Vanatrip® Adapin® Dilenor® Sinequan® Tofranil® Tofranil® PM Aventyl® Pamelor® Surmontil® Remeron® Remeron® SolTab®	Bupropion (Aplenzin®, Wellbutrin®*, Wellbutrin SR®*, Wellbutrin XL®*, Zyban®*) *Black Box warning for increased risk of seizure. nefazodone (genericst) †Black Box warn-ing for liver failure and suicidal thoughts
Selective Serotonin Reup-take Inhibitors (SSRIs) <i>Initial weight-loss followed by gain within 6 months in a minority of patients</i>	sertraline paroxetine fluvoxamine	Zoloft® Paxil®, Paxil® CR, Pexeva® Luvox®, Luvox® CR	
Lithium <i>Gains in 11% to 65% of treated patients; up to 10 kg or more in 6 to 10 years</i>		Eskalith®, Eskalith CR®, Lithobid®	
Antipsychotics (most likely to cause weight gain)			
	haloperidol loxapine clozapine chlorpromazine fluphenazine risperidone olanzapine quetiapine	generics Oxilapine®, generics Clozaril®, FazaClo® Thorazine® generics Risperdal®, Risperdal® M-TAB® Zyprexa® Seroquel®, Seroquel® XR	Ziprasidone (Geodon®)

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Drug Class/Type (and Potential Related Weight Gain)	Common Name	Proprietary or Brand Name	Alternative Drugs (Weight neutral or may promote weight-loss)
Antiseizure/anticonvulsants			
Variable gains of up to 15 to 20 kg	valproic acid (sodium valproate, divalproex sodium)	Depakote® Depakene® Depakote® ER Depakote® Sprinkle Stavzor®	topiramate (Topamax®) zonisamide (Zonegran®) lamotrigine (Lamictal®)† ‡ Black Box warning for serious rash.
Gains of up to 15 kg during 3 months of treatment	carbamazepine	Carbatrol® Epitol® Equetro® Tegretol® Tegretol® -XR	
	gabapentin	Horizant® Neurontin®	
Steroid Hormones			
Oral Corticosteroids <i>(used to treat systemic anti-inflammatory diseases) Polymyalgia rheumatica: 2 to 13 kg</i> <i>Gains in >50% patients receiving 1 year daily prednisone</i>	prednisone cortisone	Prednisone Intensol® Sterapred® Sterapred® DS	NSAIDs (where appropriate)
Inhaled Corticosteroids <i>(used to treat asthma)</i>	budesonide ciclesonide fluticasone	Pulmicort® Alvesco® Flovent®	
Hormone Therapy/ Contraception <i>hormone therapy (used to treat menopausal symptoms and contraceptive agents to prevent pregnancy)</i>	estrogen progestagens		
Miscellaneous Agents			
Antihistamines <i>(Taken for sleep in patients affected by obesity, Benadryl® can mask sleep apnea; also used as allergy medication)</i>	diphenhydramine	Aler-Dryl® Benadryl® Diphenhist® Nytol® PediaCare Children's Allergy® Siladryl® Silphen® Sominex® Unisom® generics	decongestants and inhalers
Beta-Adrenergic Blockers <i>(used to lower blood pressure)</i>	propranolol	Inderal® Inderal® LA InnoPran® InnoPran® XL Pronol®	ACE Inhibitors: ramipril (Altace®)† benazepril (Lotensin®)† enalapril (Vasotec®)† lisinopril (Prinivil®)†, Zestril®)†
	metoprolol	Lopressor® Toprol® Toprol XL®	Angiotensin II Receptor Blockers: losartan (Cozaar®)† candesartan (Atacand®)† † Black Box warning for use during pregnancy
	atenolol	Tenormin®	Ca++ Channel Blockers

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Beyond the Hype: Evaluating Diets and Supplements within Obesity Care

By Sarin Itty, DO; Farriangie Dorcé, MD; Sumeet Bhinder, MD and Jincy Cherian, DO

Introduction

Obesity is a significant public health crisis in the United States, affecting nearly 40% of adults. Data from the *Pew Research Center* highlights that between 2017 and 2018, a staggering 73.1% of U.S. adults aged 20 and older were classified as either overweight (31%) or obese (41%).¹ Strikingly, historic health disparities persist, as Black and Latino adults, alongside individuals residing in rural communities, experience the highest prevalence. Childhood obesity is similarly alarming, with rates having tripled since the mid-1970s.²

As a complex, chronic disease, obesity is associated with a wide range of complications, including cardiovascular disease, type 2 diabetes, certain cancers, cerebrovascular events, and adverse mental health outcomes. Although recent advancements in pharmacotherapy have shown promising results in promoting weight loss, many patients lack access to these medications due to prohibitive pricing or strict insurance criteria, while others simply prefer non-pharmacologic routes. Managing obesity in primary care is notoriously challenging, requiring highly individualized, sustainable strategies that extend beyond conventional “eat less, move more” advice.

Integrative medicine offers a complementary framework by incorporating evidence-based therapies that address both physiological and behavioral contributors to weight gain. This article focuses on the clinical utility of selected herbal supplements, such as green tea extract and berberine, emphasizing their efficacy, safety, and potential drug interactions while reviewing the relevant research. Dietary strategies such as the anti-inflammatory diet, whole-food plant-based diet, Mediterranean diet, and intermittent fasting protocols diet are also discussed. Finally, we provide practical advice and digital resources to help clinicians safely evaluate supplements. Ultimately, these integrative approaches can enhance traditional obesity management and empower family physicians to deliver more holistic, personalized care.

Herbal Supplements

Green Tea

Green tea, a product of the *Camellia sinensis* plant, boasts a high polyphenol content. These polyphenols exert potent antioxidant

actions that attenuate reactive oxygen species and downregulate nuclear factor-Kb to produce anti-inflammatory effects.³ Green tea contains both catechins- predominantly epigallocatechin gallate (EGCG) - and caffeine, which work synergistically to increase energy metabolism, and promote weight loss.⁴ To produce green tea, the

leaves are steamed to prevent fermentation, rendering the product dry and stable. Crucially, this process preserves the natural polyphenols and health-promoting properties while preventing the enzymatic breakdown of the leaves’ vibrant green color.⁵

A systematic review and meta-analysis of six randomized controlled trials (RCTs) published in *Frontiers in Endocrinology* demonstrated that tea supplementation (green, spearmint, or marjoram) led to significant improvements in body weight, fasting blood glucose, and fasting insulin compared with placebo.⁶

Similarly, Jurgens et al. reviewed RCTs of at least 12 weeks duration in overweight or obese adults. Their findings revealed modest, though statistically non-significant, reductions in weight, BMI, and waist circumference compared with controls.⁴ With respect to safety outcomes, green tea supplementation was generally well tolerated, although hypertension and constipation were among the most commonly reported adverse events across studies.⁴ The adverse effect of hypertension may be explained by short-term impact of the effects of caffeine in green tea preparations. Across the trials reviewed by Jurgens et al., the green tea catechin dose ranged from 140.85 mg to 1206.9 mg, with the vast majority (16 of 18 studies) using doses between 270 and 645.9 mg. For clinical context, one standard cup of green tea contains approximately 50 mg of EGCG-equivalent.⁷ Although hypertension was reported as an adverse event in the studies reviewed by Jurgens et al., an RCT involving 62 patients with type 2 diabetes demonstrated that consuming four cups of green tea daily significantly reduced body weight, BMI, waist circumference, and systolic blood pressure.⁸ Overall, the literature largely supports the long-term blood pressure lowering effects of green tea.

In another randomized, double-blind, placebo-controlled trial published in *Clinical Nutrition*, researchers investigated the efficacy and safety of high-dose green tea extract (856.8mg) for weight reduction, lipid optimization and obesity-related hormone peptides.⁹ The study followed 102 women with central obesity (defined as BMI >27 kg/m² and waist circumference > 80 cm) over 12 weeks.⁹ The study group demonstrated significant weight loss,



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reduced waist circumference, and decreased BMI alongside drops in total cholesterol and LDL plasma levels.⁹ Interestingly, the intervention group also displayed lower circulating ghrelin levels and elevated adiponectin levels compared to placebo - biomarkers directly associated with pancreas satiety and improved glucose and fatty acid regulation.⁹

According to the *National Center for Complementary and Integrative Health* (NCCIH), green tea is generally considered safe when consumed as a beverage, although clinicians should consider its caffeine content.¹⁰ In contrast, green tea extract refers to concentrated preparations derived from green tea sold as dietary supplements, which carry a higher risk of toxicity. These products are commonly available over the counter or online and are typically taken orally in supplement form. Adverse effects associated with green tea extract supplements include gastrointestinal symptoms such as nausea, constipation, and abdominal discomfort, as well as elevated blood pressure.¹⁰ Furthermore, the use of oral green tea extract tablets or capsules has been linked to isolated cases of hepatotoxicity.¹⁰

Clinicians must exercise caution regarding herb-drug interactions. At high doses, green tea can reduce the plasma levels – and therefore the clinical efficacy – of nadolol and atorvastatin, and an interaction has also been documented with raloxifene.¹⁰ Family physicians should also counsel pregnant and birthing persons on current guidelines recommending moderate caffeine restriction, noting that caffeine readily passes into breast milk and can cause infant irritability and poor sleep architecture.¹⁰

Berberine

Berberine is a plant alkaloid historically utilized in traditional Chinese medicine. It exhibits multi-target metabolic effects, including enhancing insulin sensitivity, lowering blood glucose, reducing the risk of metabolic syndrome, optimizing lipid profiles, and stimulating weight loss.¹¹ Mechanistically, berberine activates the adenosine monophosphate-activated protein kinase (AMPK) pathway, which upregulates energy production and downregulates fat storage. This identical pathway drives glucose transporter type 4 (GLUT 4) translocation to enhance glucose uptake and favorably modulate fatty acid oxidation.¹²

In a dose-response meta-analysis and systematic review of randomized controlled trials published in *Complementary Therapies in Clinical Practice*, berberine supplementation significantly reduced BMI and waist circumference in a dose-dependent manner.¹¹ In these studies, participants utilized an oral dose of 500 mg two or three times per day. Weight reduction effects were seen primarily in those taking a minimum of 1 gram daily over a span of 8 weeks.¹³ A meta-analysis of 12 studies published in *Clinical Nutrition ESPEN*, focused on assessing berberine intake on anthropometric parameters, C-reactive protein and liver enzymes. Conclusions noted a significant reduction in body weight, body mass index, waist circumference and CRP levels, which may have improved clinical symptoms in metabolic disorders.¹⁴ Berberine had no significant impact on ALT and AST levels.¹⁴

Berberine has demonstrated benefits not solely in weight reduction but in metabolic disorders as well. In a systematic review published in *Frontiers in Pharmacology* analyzing 18 articles, berberine was found to reduce triglycerides, total cholesterol, LDL, fasting plasma glucose and HOMA-IR scores in patients with

metabolic disorders.¹² In those with type 2 diabetes, berberine has been shown to induce the GLP-1 hormone, as a glucose-lowering factor and regulator of the microbial flora of the intestines which affects the pathways related to insulin secretion. This is promising for reducing the symptoms of diabetes and hyperglycemia with minimal adverse effects. Berberine-induced GLP-1 secretion has been linked to preventing mitochondrial damage, reducing adipose tissue fat and reducing oxidative stress.¹⁵

As per *NCCIH*, side effects reported in research studies include primary gastrointestinal symptoms like nausea, abdominal pain, bloating, constipation or diarrhea. It may interact with various medicines as well, including cyclosporine, which is used to prevent rejection after organs are transplanted.¹³ Berberine is likely unsafe for infants and those breastfeeding and it is considered unsafe for use in pregnancy due to it being linked to a harmful buildup of bilirubin in infants.¹³

Garcinia Cambogia

Garcinia cambogia is a tree that is native to India, Western Africa, and Southeast Asia. The fruit has been used as a tea for inflammation and stomach issues in folk medicine; the rind contains hydroxycitric acid (HCA), which has demonstrated appetite suppression in a few studies.¹⁶ HCA inhibits the enzyme ATP-citrate lyase, which is involved in endogenous lipid biosynthesis; the compound also increases hepatic glycogen synthesis, suppresses appetite and decreases body weight gain.¹⁷ In rats, it was found to protect against obesity by inhibiting fatty acid synthase activity and enhancing enzymatic activity related to fatty acid beta oxidation.¹⁸ A meta-analysis published in *Complementary Therapies in Medicine* assessing trials involving 530 subjects, demonstrated the supplement had a significant effect on body weight, BMI, percent body fat mass and waist circumference when compared to the placebo group.¹⁹ However, as per another review published in the *Journal of Obesity*, garcinia extracts and HCA can cause short-term weight loss, although it is a small amount, and the clinical relevance is uncertain.²⁰ Further rigorous trials are necessary to fully clarify its clinical utility.

As per the *NCCIH*, side effects include headache, nausea, diarrhea, and other gastrointestinal symptoms. There are safety concerns with this supplement since there have been numerous reports regarding liver toxicity.¹⁶ When this supplement is used, it is important to consider medication interactions; interactions have been noted with some drugs affecting the liver and some drugs affecting serotonin. Other herbal products may also interact with this product.¹⁶ There is limited data on garcinia cambogia use during pregnancy or while breastfeeding; therefore, it should be avoided.¹⁶

Fiber Supplements

Dietary fiber helps maintain human health in multiple ways. Soluble fiber draws water into the digestive tract, which improves glucose tolerance and helps lower cholesterol over time.²¹ Examples of soluble fiber include pectin, soft parts of fruit, dried beans, peas and psyllium husk (which is also a source of insoluble fiber). Insoluble fiber, on the other hand, can be found in the peels of fruit, acting as a laxative and gives stool its bulk.²¹ A simplified approach to weight loss is to increase fiber intake, which is a strategy especially useful to those who are having difficulty being adherent to their diets, as demonstrated by a study published in *Annals of Internal Medicine*.²²

The standard American diet has about 10-15 grams of fiber daily while the recommended dietary fiber intake is 25-50 grams per day as per the *Obesity Medicine Association*.²³ Higher fiber intake is associated with a greater variety of healthy gut bacteria and less chronic disease.²³ The initial increase in fiber can lead to gas, bloating, and cramps if titrated too rapidly; therefore, it is important to slowly increase the intake of high fiber foods. Fiber-rich foods include most vegetables if steamed, roasted or raw, unprocessed whole grains, and fruits like apples and bananas.²³

In a randomized control trial published in *Foods*, a study was conducted to investigate the synergistic effects of energy restriction and four dietary fiber supplements on changes in the anthropometric and biochemical parameters of 100 overweight or obese participants who were assigned to one out of 4 fiber supplements or given a placebo treatment for the duration of 8 weeks.²⁴ The fiber supplements, along with energy restriction, had significantly reduced the body weight, BMI, fat mass, and visceral fat at 4 and 8 weeks after the start of the study; the lipid profile and inflammation level had also improved.²⁴ The fiber supplement containing glucomannan, insulin, psyllium and apple fiber was the most

effective at reducing BMI, body weight, and CRP.²⁴ Fiber supplements, along with energy restriction, can provide a synergistic effect for accelerating weight loss.

In the *POUNDS* lost study, published within the *Journal of Nutrition*, dietary fiber intake promoted weight loss and dietary adherence in overweight or obese adults who were following a calorie-restricted diet.²⁵ A systematic review and meta-analysis of 12 RCTs ranging from 2 to 17 weeks in duration demonstrated that isolated soluble fiber supplementation improved anthropometric and metabolic outcomes in overweight and obese adults.²⁶

Fiber supplements can delay the body's absorption of certain medications; ideally, medications should be taken at least 1 hour prior to or 2-4 hours after taking fiber.²¹ It is also important to drink 8 ounces of water with fiber supplements. Contraindications to taking fiber supplements include difficulty swallowing, impacted stool, esophageal stricture, or any other narrowing/obstruction of the gastrointestinal tract.²¹ Fiber supplements can interact with antidepressant medications, diabetes medications, carbamazepine, cholesterol-lowering medications, and digoxin.²¹

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Dietary Changes

Comparison of Different Diet Types in Targeting Obesity: Evidence, Strengths, Limitations, and Safety

Diet Type	What is it?	Evidence for Weight Management and Metabolic Health	Strengths	Drawbacks/ Limitations	Safety/ Adverse Effects
Anti-Inflammatory Diet	Focuses on nutrients that decrease inflammation Emphasizes omega-3 fatty acids, monounsaturated fatty acids, antioxidants, polyphenols, dietary fiber, phytochemicals, probiotics, vitamins and minerals, and low glycemic index foods ²⁷ Restricts pro-inflammatory foods (red/processed meat, high sugar foods, deep fried foods, trans fats and refined carbohydrates)	In a study of 81 participants with obesity who underwent an energy-reduced anti-inflammatory diet for 24 weeks, researchers noted a significant reduction in body weight, visceral adipose tissue, and improvement in cardiometabolic/inflammatory statuses ²⁸	Targets chronic systemic inflammation, which plays a central role in many obesity-related diseases such as metabolic syndrome Improves gut health Exhibits high patient adherence rates	Can be challenging to sustain initially. Large RCTs currently lack long-term follow up data Heterogeneity exists across multiple versions of the diet Presents a potential risk for specific nutrient deficiencies, if unmonitored Sourcing fresh ingredients can be costly and requires time and effort	Generally safe with no notable adverse effects reported
Intermittent Fasting	A dietary approach focusing on eating within a specific window and fasting outside of it Multiple modalities exist, including the 16/8 method (fasting 16 hours daily and eating within an 8-hour window), the one-meal-a-day (OMAD) method, alternate day fasting, and the 5:2 protocol (normal eating 5 days per week with 2 non-consecutive days restricted to under 500 or 600 calories)	A 12-month RCT in China comparing time-restricted eating (8-hour window) combined with calorie restriction to calorie restriction alone found that both cohorts achieved nearly identical reductions in weight, body fat, visceral fat, blood pressure, glucose levels and lipid levels over the one-year study period ²⁹ Both groups also demonstrated improvements in fasting glucose, lipid levels and HOMA-IR index values, alongside reductions in lean mass, abdominal visceral fat, subcutaneous fat and hepatic steatosis ²⁹	Cost-effective Yields increased adherence rates compared to some chronic, calorie-restricted diets	Significant heterogeneity among fasting protocols makes comparing data within the literature difficult May require close monitoring for patients with diabetes on insulin, though studies demonstrate its clinical feasibility alongside a reduction in total daily insulin requirements	Common side effects include hunger, fatigue and irritability May be contraindicated or difficult for patients with specific clinical conditions (e.g., unstable diabetes, pregnancy, or active eating disorders) Carries an inherent risk of hypoglycemia

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Dietary Changes, *continued*

Diet Type	What is it?	Evidence for Weight Management and Metabolic Health	Strengths	Drawbacks/Limitations	Safety/Adverse Effects
Whole-Food Plant Based Diet	Emphasizes minimally processed whole foods while entirely excluding animal products High intake of intact plant structures ensure calories “remain trapped within indigestible cell walls”, helping blunt glycemic impact while serving as vital prebiotics for the gut microbiome ³⁰	In a 16-week RCT, 75 participants were randomized to a low-fat, plant-based diet or a control group. The plant-based intervention cohort demonstrated significantly improved pancreatic beta-cell function and insulin sensitivity ³¹ alongside optimized body composition (decreased fat mass), and overall reductions in body weight and insulin resistance ³²	Associated with a lower risk of chronic diseases, distinct digestive health benefits, and high environmental sustainability Evidence suggests a whole-food plant-based diet can help treat, arrest, and reverse established chronic conditions such as type 2 diabetes and hypertension ³⁰	Carries a risk of specific nutrient deficiencies (e.g., Vitamin B12 or iron), if unmonitored. Increased food preparation time The initial dietary transition may cause temporary gastrointestinal symptoms like bloating and gas Grocery costs can be higher	May require targeted supplementation with fortified foods or isolated vitamins.
Mediterranean Diet	Modelled after traditional eating patterns of countries bordering the Mediterranean Sea It consists of a high consumption of plant-based foods (vegetables, fruits, nuts, legumes, and cereals) and healthy fats (extra virgin olive oil, omega-3 fatty acids from fatty fish, nuts). It is inherently low in ultra-processed foods and saturated fats, includes moderate fish and poultry intake, and features highly limited sweet, red meat, and dairy products	A 16-week study of 144 postmenopausal women with central obesity randomized participates to either a moderate-fat Mediterranean diet (MED) or a Central European Diet (CED, moderate carbohydrates, high fiber). Body weight, waist circumference, visceral fat significantly improved in both arms for both groups, alongside sweeping improvements in lipid panels, glucose and blood pressure ³³ Furthermore, a narrative review of four meta-analyses (encompassing 16 RCTs) concluded that the Mediterranean diet produces a greater long-term reduction in body weight and BMI compared to standard low-fat control diets ³⁴	Linked to profound reductions in cardiovascular disease, stroke and overall chronic disease mortality risk Optimizes gut microbiome ³⁵ biodiversity, decreases circulating inflammatory mediators, ³⁵ effectively addresses dyslipidemia ³⁵ and protects against long-term weight gain with higher adherence ³⁴	Sourcing fresh ingredients can be costly (often higher than a basic plant-based diet) The framework can be vague and subject to patient misinterpretation It is easy to overconsume calories via calorie-dense healthy fats (nuts and oils) if unmonitored Can feature a high sodium content depending on specific food selections (e.g., olives, cheeses or cured options)	Requires clinical caution in individuals with seafood allergies, those taking oral anticoagulants (due to sudden shifts in dietary vitamin K) or those with advanced chronic kidney disease (due to high potassium load from plant foods)

How Family Medicine Physicians Can Approach Weight Loss

Clinicians should aim to approach obesity care with a personalized, stepwise approach. As detailed above, there are numerous avenues to approach weight loss. Each patient has a distinct history and lifestyle that requires a collaborative discussion of realistic, patient-driven modifications to meals, snacks, and beverages. It would be best practice to utilize the initial visit to get a thorough sense of a patient’s daily life. For example, doing a 24-hour diet recall with the patient is a great starting point. This consists of asking for wake-up times, the time of each meal and snack, what is typically eaten for each meal, drinks, and which supplements, if any, are taken. Another option is having a patient

keep a “food diary” where they write down everything they eat or drink for about 1-2 weeks. Both options give a more definitive sense of lifestyle and eating habits. In turn, this gives a good foundation to begin small edits. Once small diet changes have been made, and the patient feels that these changes are sustainable long-term solutions, supplements can be considered as an adjunct to lifestyle changes. When selecting supplements, clinicians should review available formulations, potential side effects, and interactions with current medications. A trial period of 8–12 weeks is recommended to adequately assess efficacy.

There are several resources available to help clinicians evaluate supplements within integrative medicine. The NIH Office of Dietary Supplements has helpful information online regarding various

supplements. Other websites which may be helpful include the National Center for Complementary and Integrative Health (nccih.nih.gov) and the integrative medicine section of the Memorial Sloan Kettering Cancer Center website (<https://www.mskcc.org/cancer-care/diagnosis-treatment/symptom-management/integrative-medicine/herbs>). Certain websites like consumerlab.com require subscription for a more in-depth review of supplements.

Effective obesity management without prescription medications rests on individualized care. Dietary modification remains the foundation of sustainable weight loss, with the optimal diet defined as one the patient can maintain long-term with minimal burden. Supplements serve as a useful adjunct when taken consistently as suggested. Ultimately, obesity care should always be personalized in order to ensure the patient's success and optimize the sustainability of such changes.

Endnotes:

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Lillian Russell: Plump or Corpulent?

Thomas C. Rosenthal, MD

Nineteenth-century physicians were uncertain, even puzzled, about the impact of body weight on health. Until the 1880s, few physicians had a way to weigh patients in the office, so they used a four-stage subjective classification system of body habitus: gaunt, lean, plump, or corpulent. Society considered plumpness to be a sign of both wealth and health. Plumpness was fashionable in men, and many women wished to look like the full-figured actress Lillian Russell. Russell, a New Yorker, was an American idol for her work in comic opera and musical theater, and admired for being voluptuous.¹

In the 1850s, medical journals started publishing case studies suggesting that the heaviest stage (corpulence) put a strain on the heart and made patients prone to languid circulation, apoplexy, dropsy, pneumonia, erysipelas, peritonitis, and gangrene. Though the metabolic effects of obesity were poorly understood, doctors recommended corpulent patients reduce their intake of rich foods and alcohol while adding moderate exercise to their routine. Purgatives and diuretics were occasionally prescribed. By the twentieth-century, things changed as American culture became charmed by efficiency and science, and a growing anxiety over excess and abundance took hold. When home bathroom scales became available in the 1920s, obesity became a health issue subject to medicalization. In response, employers and public health officials began some of the nation's first organized weight-reduction programs, but it would be the 1950s before obesity was defined as a multifactorial health threat.²

One of the first studies relating obesity and heart disease had been published in 1851 by the *Boston Medical and Surgical Journal* (today's *New England Journal of Medicine*). The study described autopsy findings in the hearts of 57 obese patients. Causes of death included: dropsy and apoplexy (24 patients), aneurism (5), accidents (10) and non-cardiac conditions (18). Only seven patients had healthy-appearing hearts, and four of those were accidental deaths. All the remaining autopsies revealed heart disease. Thirteen showed hypertrophied heart muscle, 26 had stretched and dilated hearts, 11 showed atrophy, and 16 patients had fatty tissue around the heart. Some patients had complained

of dyspnea before their death. These patients had normal-appearing lung tissue, but their chest cavities were restricted by abdominal girth.³

Through the 1800s, people became increasingly aware of the food they ate. Early in the century, Sylvester Graham (1794-1851) toured

the country marketing a vegetarian diet anchored by his coarsely ground wheat flour. Graham was a Presbyterian minister, lecturer, and hydrotherapist who also believed that sexual activity, particularly self-stimulation, depleted the body and led to premature death and blindness. Graham preached that potatoes and Graham flour were sufficient to sustain the human body in a state of vigorous health. His graphic lectures caused "proper" women to faint.⁴ None-the-less, plumpness persisted as a sign of having sufficient resources to afford ample regular meals. For the female gender, this was the Lillian Russell voluptuous look that forced women into corsets to accentuate their hips and bosoms.¹



In 1863, a 66-year-old businessman who suffered from corpulence, William Banting, published a pamphlet outlining his experience conquering obesity. He was 5 feet 5 inches tall and started his project weighing 202 pounds (BMI 33.6). One year later, he weighed 167 pounds (BMI 27.8). He attributed the weight loss to rowing his boat two hours each morning; but when that alone seemed insufficient,

he limited his intake of bread, butter, milk, sugar, beer, and potatoes. His diet emphasized meat and fish. Before losing weight, he had to go down stairs backwards to limit the jarring pain in his ankles and knees, and he huffed and puffed with the slightest exertion. Banting observed that corpulence had inflicted "undue violence" upon his body and interfered with the free action of his organs. Once he conquered his corpulence, he could face forward while descending stairs.⁵

Nineteenth-century physicians encouraged patients to recognize plumpness and corpulence as distinct categories with gravely different effects on health. Corpulence prevented patients from enjoying the healthy outdoor pastimes that increased blood flow, stimulated breathing, and improved health. By 1875, the first

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evidence of metabolic disturbance came with the discovery that obese patients were more likely to have sugar in their urine.⁶

As the cultural tide turned, cartoonists used fatness as a metaphor for excess in governance, and the “fat cat” politician became a staple of satire. That an ungraceful abdominal protuberance might be associated with poor performance both physically and mentally became quite bothersome to middle- and upper-class people. For the wealthy, it meant spending six weeks at a health spa in an effort to return to a pleasing plumpness and a more youthful appearance.⁶ A product called Allen’s Anti-Fat became a popular quack remedy for corpulence. The key ingredient was *Fucus vesiculosus*, or bladderwrack, a brown seaweed that contains iodine. It may have actually helped the rare individual with hypothyroidism.¹

As better nutrition and medical advances led to longer lives, heart disease and cancer became as worrisome as infectious disease. Insurance companies, noticing that those with higher weights on pre-insurance exams experienced earlier deaths, adjusted their rates accordingly.⁷ In the 1920s, anti-fat sentiment escalated, and like many behavioral issues, corpulence became a medical problem in need of solving. Drugs, diets, and exercise regimens, with and without scientific backing, arose to confront excess body weight.⁸

A twenty-first-century survey of primary care physicians found that half view obese patients as awkward, unattractive, and noncompliant. A third added weak-willed, sloppy, and lazy. Most of the 620 surveyed physicians regarded obesity as a behavioral problem related to physical inactivity and overeating. British doctors felt much the same way, perceiving overweight people to have reduced self-esteem, poorer health, and were unattractive sexually. On the flip side, 70% of patients reported feeling that most doctors did not understand how difficult it is to be overweight.⁹

Today plump people might find themselves in the BMI overweight category (BMI 25 to 29). Studies show this category carries no additional risk of death and may even provide health benefits.¹⁰ Still, body weights above leanness continue to be stigmatized. Science, culture, and medicalization not only change with the times but can also be contradictory. Science now tells us that multiple genes influence hunger, satiety, and resting metabolic rate through altered leptin and melanocortin signaling. Conditions like hypothyroidism, Cushing’s syndrome, and polycystic ovary syndrome (PCOS) may also affect body weight, as does limited access to healthy, affordable food and lack of safe spaces for physical activity.

Physical activity has been thought to be important for several centuries, and today we know that repeated muscle contractions release myokines that reduce inflammation, improve insulin

sensitivity, and promote brain development. An observation that holds true even for patients who lose weight on drug therapy, including GLP-1 agonists.

The plump and corseted Lillian Russel entered theaters to thunderous applause, raising roofs across America. Her intonations were so pure that Alexander Graham Bell insisted Russell’s tones be the first voice carried across the long-distance telephone line laid in 1890. Maybe it is time we honored voluptuous plumpness while still chiding corpulence. Some men and women striving for a body habitus beyond their grasp need our counsel. But for the corpulent, modern tools and new knowledge are helping us help them. Like most multifactor health challenges, self-image will always be best managed within continuity relationships forged between a patient and their family doctor.

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The Impact of Weight Bias and Weight Neutrality in Primary Care

Twisha Shah, MD, MS and Caroline Donohue, MD, MS

Introduction: Obesity, BMI, and Potential Harms to Patients

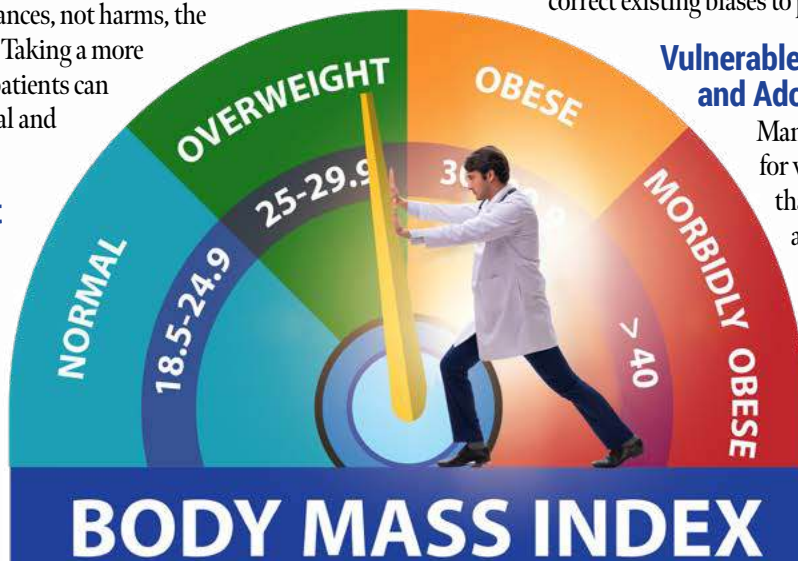
Obesity is a complex chronic disease that has become a global epidemic, with a continuous rate of increase.¹ According to the World Health Organization, worldwide adult obesity has more than doubled and adolescent obesity has quadrupled since 1990.² It is widely known that obesity is correlated to many co-morbidities, including cardiovascular disease, endocrine disorders, and respiratory issues. However, the relationship between a person's weight and overall health is complex and is not a direct correlation. Take for example, BMI (body mass index). BMI is the ratio of weight (kg) to height squared (m²). This formula was devised in the 19th century by Belgian mathematician Adolphe Quetelet. His intention of creating the formula was to define the indices of the average man and be able to see the distribution around that norm. He did not have a direct interest in obesity, and the formula was never intended to be an indicator of health.³ Furthermore, the data he used to create the formula was based mostly on white, high-income individuals. BMI does not consider lean body mass, location of body fat, or cardiometabolic health.⁴ In fact, it is a rather poor predictor of overall health, with some studies showing that people in the "overweight" BMI category have lower mortality than those in the "normal weight" category.⁴ Clearly, BMI has its faults despite its widespread use in modern medicine, and problems can arise with using this as a measure of health.

Many studies have shown that physicians tend to have a negative outlook on patients with obesity and weight becomes the central part of the conversation about any adverse health conditions. This can potentially lead to more harm than the patient's weight itself.⁵ While it is important for family medicine doctors to be able to treat patients at risk for cardiometabolic disease, it is also important that family doctors do so in a way that enhances, not harms, the patient-physician relationship. Taking a more weight neutral approach with patients can ultimately lead to better physical and psychological outcomes.

Weight Loss vs. Weight Neutral Strategies and the Physician-patient Relationship

Because of the weight bias that is pervasive throughout society, the medical focus on BMI, and older recommendations focusing on weight loss, many physicians

bring unconscious bias regarding body sizes into the exam room with them. When physicians discuss weight with patients, the major focus is usually on weight loss strategies. Many guidelines recommend that weight reduction should be the mainstay of care for managing patients with obesity or overweight status.^{6,7} This is likely because many of the chronic diseases we treat in medicine have excess weight as a risk factor. Research has indicated that the root cause of many of these diseases may lie in the chronic condition of larger body sizes. This has shifted the focus of treatment of many conditions to a weight-loss centric approach, for example, recommending weight loss in diabetes to optimize glycemic control, as well as weight loss for hypertension management and knee pain.⁸ While there is some evidence to support this approach, this has ultimately led to a culture where weight has become very medicalized in the doctor's office. Anti-fat bias is prevalent throughout our society and physicians are not immune to it. A study by Foster et. al aimed to assess physician attitudes towards obese patients. They found that 50% or more physicians characterized patients with obesity as "awkward", "unattractive", "ugly", and "non-compliant."⁹ A 2023 study surveyed a large resident physician population across the US to examine how weight-bias varied among the providers. They found that almost half of the resident physicians agreed with the statement "some people are fat because they have no willpower" and 40% agreed that "fat people tend to be fat pretty much through their own fault."¹⁰ The implicit and explicit biases towards people with larger sizes can affect patient-physician relationships and lead to inequitable care. Patients experiencing weight bias are more likely to develop anxiety and depression. The stress from weight bias on patients may also directly affect their physical health. Patients who have reported experiencing weight bias have been found to have higher risk of heart disease and higher hemoglobin A1c values even when adjusted for BMI.¹¹ It is thus extremely important for physicians to be aware of and attempt to correct existing biases to provide the best care for patients.



Vulnerable Populations- Pregnancy and Adolescence

Many populations are at high risk for weight bias, but two populations that are particularly vulnerable are adolescents and patients who are pregnant or recently postpartum. Due to the psychosocial adversity faced by these populations, as well as the need for high patient-doctor contact, weight bias can affect both clinical decision-making and patient trust.¹²

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In prenatal care, weight bias may have potential consequences for maternal and fetal outcomes and psychosocial impact in the postpartum period. Prenatal, antenatal, and postpartum care are necessary to prevent adverse outcomes and consistency of this care is in part dependent on patients' comfort with their physicians. In an article from 2019, ACOG recognized that negative attitudes and biases pertaining to weight can risk patient-physician relationships due to lack of emotional rapport and less engagement in patient-centered counseling.¹¹ These biases may also lead to delayed diagnosis and treatment by blaming symptoms on obesity.¹¹ A systematic review published in 2024 found that weight bias in the perinatal period is prevalent globally among maternity care providers.¹³ Many of the studies used in this review were limited by smaller study samples, however, a consistent theme among these studies was that weight bias was associated with harmful consequences such as gestational diabetes, excessive weight gain, decreased rates of breastfeeding, and increased depressive symptoms.² It is unclear the exact cause of these adverse outcomes, but it's possible that harm to the patient-doctor relationship may be leading to fewer visits, less communication, and less trust in physician recommendations. Regular visits during the prenatal period allow physicians to screen patients for medical conditions but are also important for checking in on psychosocial stressors that may contribute to anxiety, depression, and domestic violence. In the postpartum period, close follow-up allows physicians to monitor for signs of postpartum depression, encourage early breast feeding, and ensure adequate physical recovery. It is important for maternity care providers to be aware of and attempt to avoid weight biases to foster this patient-physician relationship and reduce the risk of adverse outcomes.

Similarly, adolescents are another population that are vulnerable to the risks associated with weight bias. Per the NY Department of Health, 1 in 5 children in the state of NY have an obese weight status.¹⁴ A study by Wear et. al in 2006 surveyed medical student attitudes towards a variety of patients. These students reported that severely obese patients, including children, were a common target of derogatory humor.¹⁵ Phul and Latner performed a literature review exploring weight stigma in children and adolescents and its effect on psychosocial and physical health. This review suggested that weight stigma may specifically exacerbate negative health outcomes in young people including cardiovascular health and vulnerability to stress.¹⁶ A study in 2018 surveyed 148 youth enrolled in a national weight loss camp on their preference of health care provider language when discussing weight. They found that words such as "weight problem", "BMI", and "plus size" were more preferred terms.¹⁷ It can be helpful to choose some of these terms when discussing weight in a visit with adolescent patients. When treating children and young adults, physicians also need to form a relationship with the parents. In a survey of 427 parents, over 35% reported that they would seek a new doctor if they perceived weight stigmatization and 24% reported they would not attend future appointments.¹⁸ Routine follow ups are essential to ensure appropriate developmental growth, remain up to date on vaccinations, and to screen patients for mental health disorders. By using a weight neutral approach, we can build better relationships with patients and families which can lead to earlier identification and treatment of health problems.

What Can Physicians Do? Strategies to Mitigate Bias

There are specific strategies that family doctors can adopt to take a less biased and more weight-inclusive approach to patient care. Providers should remind themselves and their colleagues that all bodies are unique and deserve the same quality of care. They can focus on recommending sustainable habits for a healthy lifestyle that are process oriented instead of goal oriented.¹⁹ This can be accomplished by focusing dietary and exercise recommendations on energy levels, functionality, and prevention rather than a specific number of pounds to lose or a size to change to. For example, a physician can discuss how decreasing refined sugar and moving towards a plant-based diet can help with diabetes management and prevention of complications, or how regular exercise can help with knee arthritis pain. There is evidence to support that taking a weight neutral approach with patients can be as effective as a weight loss approach when it comes to a patient's psychological and physical health, and some cases where weight neutrality has actually been shown to be more beneficial to a patient's health.²⁰ It is also helpful to think about the language that is used in healthcare settings. For example, terms such as "higher BMI" or "excess weight" can feel less stigmatizing than terms such as "obese" or "morbidly obese." It should be noted that the ICD10 codes used for obesity in patient charts no longer use this language either, and now specifically code for class 1, 2, and 3 obesity and have eliminated the word "morbid" from medical documentation. The overall goal of a weight neutral approach is to promote respect for body diversity and improve health independent of weight loss or body size.²¹

One of the most important ways to mitigate weight stigma is to identify personal biases that we are unaware of. There are many tools for this, but one of the most popular is the *Harvard Implicit Association Test* (IAT), which has a specific "Weight IAT" tool to help identify biases.²² These tools are not created to make us feel guilty, but rather to learn more about what unconscious biases we have. By being more aware of our biases, we can have an easier time bringing them to the surface and eventually eliminating them.

HAES (Health at Every Size) is a movement that promotes body respect and acceptance of body diversity with health outcomes by focusing on mental and physical well-being irrespective of body size.²¹ It is based on research that shows that although weight loss has been shown for many patients to provide health benefits, a larger body size is not directly correlated to poorer health. There are emotional and social components to health that can be tied to a patient's perception of their body size, and social determinants of health that can make a goal of weight loss less attainable. HAES focuses more on the concepts of intuitive eating, joyful movement, and body respect.²¹ Physicians can adopt these principles in interactions with their patients by discussing listening to hunger cues and responding by eating nutritious foods, exercising in a way that feels good and improves energy levels, and expressing respect for all body types and sizes. It can also be helpful for physicians to name and discuss the harms of weight bias that exist in society and how this may have affected a patient's life and health journey thus far. Lastly, it is also helpful to make the doctor's office a more welcoming place – having larger cuff sizes for blood pressures, chairs and exam tables that accommodate different body sizes, and giving patients an option to self-report their weight rather than having them stand on a scale at every visit.

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Conclusion

There has been a plethora of research over the years that shows how weight stigma can cause physical and mental harm to our patients. As we outlined, adolescents and pregnant patients are particularly vulnerable groups that are at an increased risk for weight stigma and inadequate healthcare. Both of these populations need routine follow-up and require strong patient-physician relationships as an important piece of their care. By approaching the topic of obesity as a chronic condition and in a weight neutral manner, there may be an improved therapeutic relationship which can ultimately lead to better patient outcomes. By being aware of the weight bias that exists in society and the unconscious bias that we may ourselves have, physicians can take the first steps in fighting against these biases in the exam room. We believe that following these principles when caring for all patients can lead to more optimized patient care. All bodies are unique. All patients deserve respect and holistic care and the relationship between weight and health is complex. As family medicine physicians, it is our duty to acknowledge these concepts, be aware of our own biases, and use our knowledge and understanding to provide the most equitable patient care possible.

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Oral Weight Loss Medications Beyond GLP-1s: Efficacy, Risks, Cost, and Obesity Management

By Ani A. Bodoutchian, MD, MBA, DipABOM, FAAFP, CPE and Stephan A. Chirinian

Introduction

Obesity is a chronic, relapsing disease shaped by genetic, neurohormonal, metabolic, psychological, drug-induced, and environmental factors that together disrupt appetite signaling, energy expenditure, and reward pathways.^{1-3,5,13,15} So the idea that weight loss is “one and done,” or purely a cosmetic goal, sets patients up to fail. As of early 2026, the World Health Organization estimates that obesity affects roughly 1 billion people worldwide, including 160 million children.³

Obesity treatment requires a comprehensive approach that melds medication, exercise, nutrition, and behavioral change. Any medication used should be paired with lifestyle intervention; otherwise, treatment is less likely to be effective or durable. When choosing medications, clinicians must consider not only cost, but also efficacy, safety, tolerability, and whether the treatment can realistically be continued long-term or even lifelong.^{1,2,5,7}

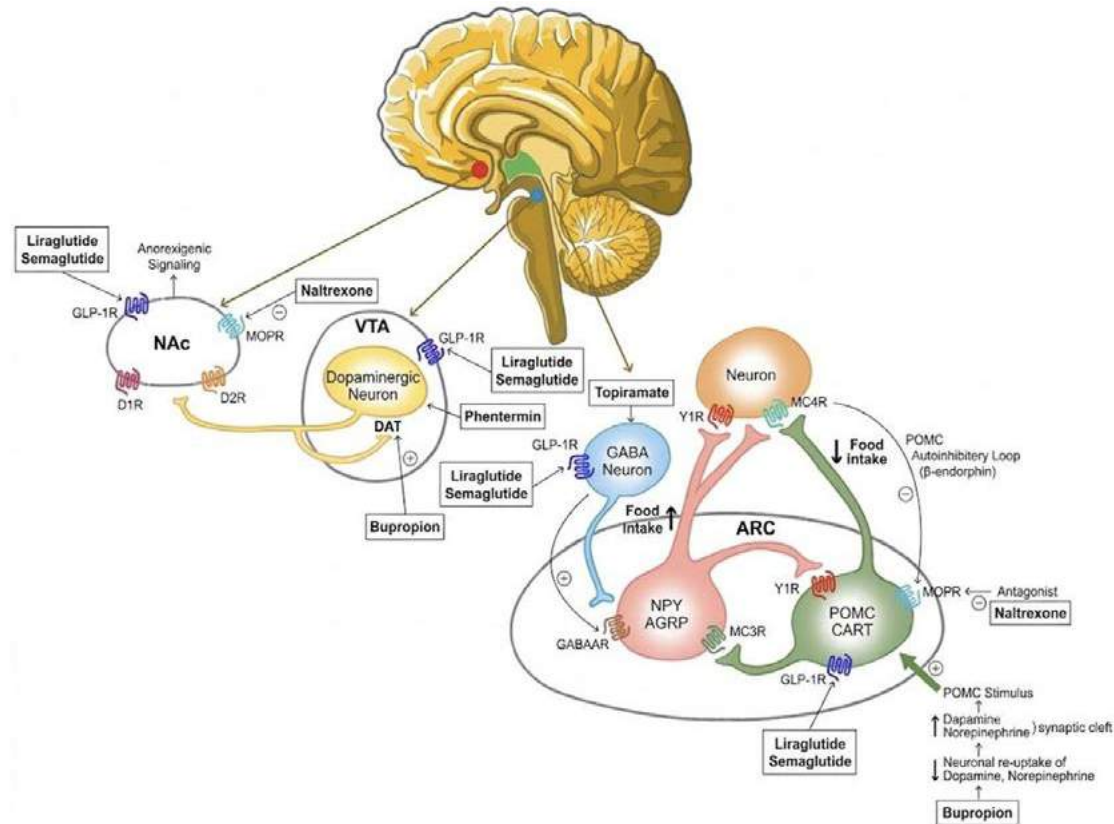
Recent attention has centered on glucagon-like peptide-1 (GLP-1) receptor agonists because of their unprecedented efficacy, but oral non-GLP-1 agents remain widely used for their accessibility and lower cost.⁴ These older medications still play an important role in individualized care, particularly when newer agents are contraindicated, unavailable, or unaffordable.⁴ Broadly, they fall into five categories by mechanism: sympathomimetic amines, lipase inhibitors, metformin as an off-label option in select patients, combination medications, and incretin mimetics.^{2,5,6}

Where It All Begins: Neurohormonal Regulation of Appetite and Body Weight

Body weight is centrally regulated by two connected systems: homeo-static appetite circuits and reward-based feeding circuits.^{1,2,13,15} As Figure 1 illustrates, these systems integrate signals from the brain, gastrointestinal tract, pancreas, adipose tissue, and circulating nutrients to govern hunger, satiety, energy balance, food motivation, and eating behavior.

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Figure 1. Hypothalamic appetite pathways and mesolimbic reward pathways, with the medications that act on each node.
Adapted from Tak & Lee, 2021.⁶



Abbreviation key: AGRP, agouti-related peptide; ARC, arcuate nucleus; CART, cocaine- and amphetamine-regulated transcript; DAT, dopamine active transporter; D1R, dopamine 1-class receptor; D2R, dopamine 2-class receptor; GABA, gamma-aminobutyric acid; GABAAR, γ-aminobutyric acid type A receptor; GLP-1R, glucagon-like peptide-1 receptor; MC3R, melanocortin-3 receptor; MC4R, melanocortin receptor; MOPR, μ-opioid receptor; NAc, nucleus accumbens; NPY, neuropeptide Y; POMC, proopiomelanocortin; VTA, ventral tegmental area; Y1R, neuropeptide Y receptor type 1

The homeostatic system tracks the body’s physiologic energy needs. Within the hypothalamus, the arcuate nucleus (ARC) is a key site of signal integration: NPY/AgRP neurons stimulate hunger and food intake, while POMC/CART neurons promote satiety through melanocortin signaling.^{1,2,6,13,15} Peripheral signals from the gut, pancreas, adipose tissue, and circulating nutrients continuously shape the activity of these neurons.

Eating, however, is not governed by physiologic hunger alone. The mesolimbic dopamine system, particularly projections from the ventral tegmental area (VTA) to the nucleus accumbens (NAc), drives food motivation, cravings, hedonic eating, and the desire for highly palatable foods.^{6,13,14}

GABAergic signaling adds a layer of inhibitory control over both circuits, tempering activity in the appetite and reward systems alike.^{1,2,4,6}

These pathways help explain why anti-obesity medications do not act on a single “appetite center.”^{1,2,5} They work across an integrated gut–brain–hypothalamic–reward network and, depending on the agent, treatment may lower physiologic hunger, raise satiety, blunt cravings, alter gut feedback, or dampen the drive to eat for pleasure.^{1,2,4,5,13}

Figure 1 also maps out how commonly used weight-loss medications influence these pathways:⁶

- Sympathomimetic agents, including phentermine, primarily act on hypothalamic appetite circuits, including the ARC.
- Phentermine/topiramate (Qsymia) affects hypothalamic appetite pathways and GABAergic signaling tied to the ARC.
- Naltrexone/bupropion (Contrave) acts within the ARC, particularly the POMC/CART pathway, as well as the VTA-NAc reward pathway.

GLP-1 receptor agonists influence appetite-regulating and reward-related pathways, including the ARC, VTA, and NAc, thus linking homeostatic appetite regulation with food-reward signaling.

Orlistat is not included in Figure 1 because it acts locally in the gastrointestinal tract rather than through central appetite or reward pathways.

Each of these medications is discussed individually below.^{5,6,9,12,18-20,22,23,26}

Mapping Central Nervous System Targets

Clinically, it matters which of these pathways a given medication engages, because that determines both its likely benefit and its likely side effects.^{1,4,5,13} Figure 2 groups the anatomy above into three systems.

The ARC is the main site for appetite suppression and satiety signaling, the effect patients usually describe as simply “feeling less hungry.”^{1,5}

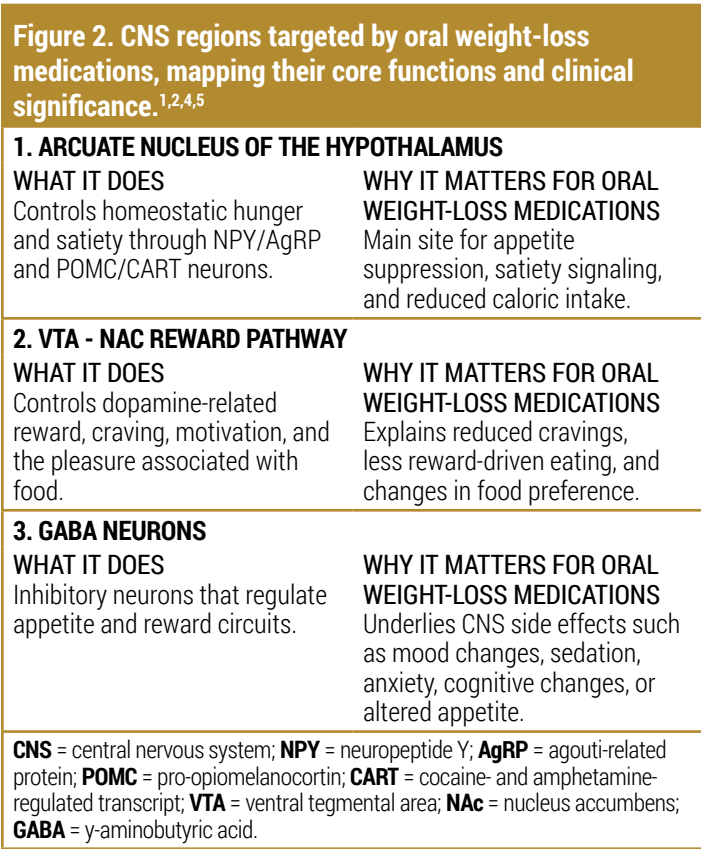
The VTA-NAc pathway governs reward-driven and emotionally driven eating; medications acting here blunt cravings and the draw toward highly palatable foods rather than physical hunger itself.^{5,13,14} This pathway helps explain the saying, “I am not eating because I am hungry; I am eating because it tastes good.”

GABAergic neurons provide inhibitory tone over both circuits, which is why GABA-acting agents can affect appetite while also

producing CNS side effects such as sedation, anxiety, or cognitive slowing. The extent of these effects depends in part on how strongly the medication influences GABAergic signaling.^{6,20}

A single medication may affect one or several of these systems at once, and because each patient has distinct neurobiology, metabolism, comorbidities, and medication sensitivity, responses can vary: one patient may report better appetite control, while another may experience more side effects, depending on which pathway is most strongly affected.^{1,5,6}

This also explains why stopping a medication tends to bring weight back. Once pharmacologic suppression of these pathways is withdrawn, hunger signaling, craving pathways, and weight-regain mechanisms can re-emerge, increasing the likelihood of relapse and weight rebound toward the patient’s prior set point.^{1,6,15,16} That is the clinical argument for treating obesity as a chronic disease requiring long-term management rather than a short-term fix.^{1,2,15,16}



Sympathomimetic Agents^{1,2,4-6,8,13,14}

These medications suppress appetite by increasing central adrenergic signaling. Phentermine is the best known and is FDA-approved for short-term use as an adjunct to diet and behavioral treatment; older agents in the same class include diethylpropion, phendimetrazine, and benzphetamine.^{2,5,8}

Figure 3 summarizes phentermine and its related agents — formulations, dosing, expected efficacy, and absolute contraindications — for quick reference.

Related agents shown in the lower panels: benzphetamine (Didrex), phendimetrazine tartrate 35mg, standard phendimetrazine, and diethylpropion (Tenuate).

Figure 3. Sympathomimetic agents: phentermine and related medications.^{1,2,4,5,6,8,13,14}

Phentermine (Adipex®) (Lomaira®) (Schedule IV) (FDA approved 1959) (Most commonly prescribed oral agent)	
FORMULARY Standard Capsule/tabs: 15 to 37.5mg once daily in the morning Lomaira® 8mg TID, 30 minutes before meals	
MECHANISM OF ACTION Centrally acting sympathomimetic; stimulates the hypothalamus to release norepinephrine, resulting in decreased appetite, reduced caloric intake, and increased energy expenditure. ¹	EFFICACY 3-7% mean weight loss ⁴
COMMON ADVERSE EFFECTS ADRENERGIC ACTIVITY² • Insomnia • Tachycardia and palpitations • Xerostomia (dry mouth) • Constipation • Anxiety	SERIOUS RISKS REQUIRES MONITORING^{1,2} • Elevated blood pressure and heart rate • Arrhythmias (rare) • Potential for misuse (stimulant properties)
CONTRAINDICATIONS^{1,6} • Hypersensitivity to phentermine or components • Coronary artery disease or CVD • Pregnancy • Concurrent MAOI use • Hyperthyroidism • Severe anxiety • Uncontrolled hypertension • Close-angled glaucoma • History of substance use disorder	
CLINICAL POSITIONING Despite limitations, low cost and rapid onset of action support its use as a commonly prescribed first-line pharmacologic agent for short-term obesity management. ⁴	FDA APPROVAL NOTE Approved for short-term use (≤12 weeks) in patients ≥17 years. Restriction reflects the absence of long-term safety and efficacy data, not evidence of harm.
RELATED SYMPATHOMIMETIC AGENTS	
Benzphetamine (Didrex) (Schedule III) (Approved 1960) CNS stimulant. Approved for short-term use. Mechanism and safety profile similar to phentermine.	Phendimetrazine tartrate 35mg (Schedule III) (Approved 1976) CNS stimulant. Approved for short-term use. Mechanism and safety profile similar to phentermine.
Phendimetrazine (Schedule IV) (Short-term use) Similar profile to phentermine. Associated with increased risk of pulmonary hypertension.	Diethylpropion® (Tenuate) (Schedule IV) ~3-5% mean weight loss. ⁴ Adverse effects mirror those of phentermine. ²
CONTRAINDICATIONS^{1,8} • Cardiovascular disease or severe HTN • Concurrent MAOI use • Pregnancy	
! = serious or rare adverse effect requiring monitoring. CNS = central nervous system; CVD = cardiovascular disease; HTN = hypertension; MAOI = monoamine oxidase inhibitor; NE = norepinephrine; TID = three times daily. Superscript numbers denote source references.	

A word of caution: Given that these agents raise sympathetic tone, they should be used judiciously, or even avoided, in patients with coronary artery disease, stroke, arrhythmia, heart failure, uncontrolled hypertension, or other significant cardiovascular disease.^{1,2,5,6} FDA labeling for phentermine also notes rare reports of pulmonary hypertension and valvular

heart disease, along with palpitations, tachycardia, blood pressure elevation, and ischemic events.^{1,5,8}

Baseline blood pressure and heart-rate evaluation is reasonable before starting therapy; patients with symptoms, risk factors, or known cardiovascular disease may need an electrocardiogram, echocardiogram, or cardiology evaluation first.^{1,5,7,8}

Lipase Inhibitors^{5,6,8-10,22}

Not every oral agent works in the brain. Orlistat, a lipase inhibitor, works entirely in the gut. It reversibly blocks gastric and pancreatic lipases, reducing dietary fat absorption. The prescription version (Xenical) contains 120mg; the over-the-counter version (Alli) contains 60mg.^{9,22}

Figure 4 covers orlistat's mechanism, dosing, efficacy, adverse effects, contraindications, and drug interactions.^{5,9,22}

Figure 4. Clinical profile of Orlistat, including mechanism of action, dosing, efficacy, adverse effects, contraindications, and drug interactions.^{5,9,22}

Orlistat Xenical®, Alli®		Lipase inhibitor
TYPICAL WEIGHT LOSS 3.1-10% vs. placebo	FAT ABSORPTION REDUCTION ~30% Dietary lipid	PRIMARY SITE OF ACTION GI tract Minimal systemic absorption
MECHANISM OF ACTION GI/pancreatic lipase inhibitor; decreases dietary lipid absorption in the gut. Localized action ensures minimal systemic absorption. ⁹		
ADVERSE EFFECTS		
GASTROINTESTINAL • Oily stools / spotting • Fecal urgency or incontinence • Flatulence with discharge	NUTRITIONAL • Fat-soluble vitamin deficiency • A, D, E, K - supplementation required⁸	
CONTRAINDICATIONS • Pregnancy • Cholestasis • Malabsorption syndrome		
WARNINGS AND PRECAUTIONS • Orlistat can increase the risk of acute kidney injury.⁹		
DRUG-DRUG INTERACTIONS		
• Antiepileptics - lamotrigine, valproate, vigabatrin, and gabapentin⁹ • Amiodarone⁹ • Cyclosporine⁹	• Levothyroxine⁹ • Warfarin⁹ • Antiretroviral medications – such as HIV medications⁹	

Key takeaways on Orlistat:^{9,21,22}

- Dosed three times daily, within an hour of a fatty meal; if a meal is skipped, that dose is skipped too.
- Works locally in the gut rather than centrally, so it avoids the CNS effects seen with other agents.
- The American Heart Association (2021) considers it safe in patients with heart failure with preserved ejection fraction, though this remains an off-label use requiring clinical judgment.
- GI side effects are common with dietary fat intake; counseling patients on meal composition improves tolerability.

Metformin is not FDA-approved for weight management.

It improves insulin sensitivity and glycemic control and can produce some weight loss, though the effect is generally smaller and slower than that of medications approved specifically for weight management.^{5,25,26,28}

As obesity is driven by overlapping neuroendocrine, metabolic, and reward pathways, single-agent therapy often runs into a ceiling effect, as the body's own adaptations to weight loss tend to reduce single-drug efficacy over time.^{2,5,6}

Pairing agents with complementary mechanisms is one way to address this limitation. By activating distinct CNS targets simultaneously, combination therapy may produce greater weight loss than either component alone while countering some of the biologic signals that promote weight regain.^{4,5,19,20}

The two oral combinations in use are phentermine/topiramate extended-release (Qsymia) and naltrexone/bupropion extended-release (Contrave).^{2,4-6,19,20}

Figures 5 and 6 cover Qsymia's clinical profile and titration; Figures 7 and 8 cover the same for Contrave. Both products require specific ongoing response assessments and safety precautions that guide dosing and discontinuation decisions.^{19,20}

Figure 5 covers clinical efficacy, contraindications, precautions, and common adverse effects.^{5,20}

The cardiovascular cautions above apply here too, as Qsymia contains phentermine.

Topiramate adds its own risks: cognitive effects, metabolic acidosis, kidney stones, and fetal harm. Pregnancy must be ruled out before starting and monitored throughout treatment in patients of childbearing potential.^{11,20}

Phentermine/Topiramate Qsymia®	Sympathomimetic + anticonvulsant
--	----------------------------------

TYPICAL WEIGHT LOSS RANGE 7-11% ~8-10% average in trials	PRIMARY TARGETS NE · GABA· Glutamate CNS-acting	SCHEDULE IV controlled Dependency/abuse risk
CLINICAL EVIDENCE Phentermine/topiramate extended-release (Qsymia®) produces approximately 8-10% total body weight loss, with strong evidence supporting its ability to achieve ≥10% weight reduction in a significant proportion of patients. ⁴		
MECHANISM OF ACTION Norepinephrine & GABA agonist; glutamate antagonist. Suppresses appetite via hypothalamic and limbic CNS pathways .		
ADVERSE EFFECTS		
COMMON • Paresthesia • Dry mouth • Constipation • Insomnia • Dysgeusia	SERIOUS/MONITOR • Anxiety, depression, mood changes • Memory I concentration difficulties • Increased heart rate • Suicidal ideation • Dependency and abuse risk	
CONTRAINDICATIONS • Pregnancy teratogenic • CKD, glaucoma, hyperthyroidism • Uncontrolled HTN or CVD • Concurrent MAOI use		

Figure 6 shows the *dose-escalation schedule*: Qsymia's dose is increased in stages, with response assessed at set intervals to decide whether to continue, escalate, or stop.^{1,5,6,11,20}

Qsymia® - Dose Initiation & Escalation		Titration protocol	
Phentermine / Topiramate extended-release • once daily (AM)			
STARTING DOSE 3.75/23mg Days 1-14 – once daily AM		RECOMMENDED DOSE 7.5/46mg After day 14 -evaluate at 12 weeks	
MAXIMUM DOSE 15/92mg If escalation needed – evaluate at 12 weeks			
4-PHASE DOSE ESCALATION SCHEDULE ^{1,5,20}			
PHASE 1 3.75mxg <u>/23mg topiramate</u> • Once daily -AM only • Duration: 14 days Starting/initiation dose		PHASE 2 7.5mg <u>/46mg topiramate</u> • Once daily -AM only • Begin day 15 Evaluate at week 12	
PHASE 3 11.25mg <u>/69mg topiramate</u> • Once daily -AM only • Duration: 14 days (bridge) If <3% loss at wk 12		PHASE 4 15mg <u>/92mg topiramate</u> • Once daily -AM only • Duration: 14 days (bridge) Evaluate at week 12	
RESPONSE EVALUATION GATES			
≥3% loss at week 12 (Phase 2): Continue 7.5/46mg – response is adequate; maintain current dose. ^{1,5}		<3% loss at week 12 (Phase 2): Escalate to 11.25/69mg for 14 days, then advance to 15/92mg. ^{1,5}	
≥5% loss at week 12 (Phase 4): Continue 15/92mg – patient is responding to maximum dose. ^{1,5}		<5% loss at week 12 (Phase 4): Discontinue – taper dose gradually before stopping (do not stop abruptly). ^{1,5,20}	
REMS REQUIREMENT ¹¹			
RISK EVALUATION & MITIGATION STRATEGY (REMS)			
Qsymia is subject to a mandatory REMS program due to teratogenicity – specifically risk of cleft lip and/or cleft palate in neonates exposed in utero. A negative pregnancy test is required before initiation and monthly during treatment. Effective contraception must be confirmed and maintained throughout therapy. Prescribers and pharmacies must be certified through the Qsymia REMS program. ^{11,20}			
CLINICAL RATIONALE FOR GRADUAL ESCALATION ^{1,5,6}			
CNS side effect minimization Gradual escalation reduces incidence of paresthesia, cognitive effects (memory and concentration difficulties), and mood changes associated with topiramate. ^{5,6}		Cardiovascular monitoring Phentermine increases heart rate. Slow titration allows monitoring of pulse and blood pressure before advancing – particularly important as elevated heart rate is a cause for discontinuation. ^{1,5,20}	
Metabolic acidosis risk Topiramate inhibits carbonic anhydrase, which can cause metabolic acidosis. Gradual escalation and baseline/follow-up bicarbonate monitoring is recommended. ^{5,20}		Ocular safety Topiramate can cause acute angle-closure glaucoma and myopia. Patients should be monitored for visual changes, particularly at dose escalation – this is a cause for immediate discontinuation if it occurs. ^{5,20}	
DISCONTINUATION - DO NOT STOP ABRUPTLY ^{1,20}			
Qsymia must be tapered gradually when discontinuing - do not stop abruptly. The topiramate component carries a risk of seizures upon abrupt withdrawal, even in patients without a seizure disorder. The recommended taper is to reduce the dose to every other day for at least 1 week before stopping completely. ^{1,20}			
ADMINISTRATION NOTES ²⁰			
• Take in the morning – evening dosing causes insomnia due to stimulant component		• Swallow capsules whole – do not crush, chew. or open the extended-release capsule	
		• Stay well hydrated – topiramate increases risk of kidney stones; adequate fluid intake is essential	

Naltrexone/Bupropion (Contrave)

Figure 7 covers mechanism, efficacy, contraindications, warnings, and common adverse effects.^{5,19}

Contrave is contraindicated in uncontrolled hypertension, seizure disorders, chronic opioid use, and several other conditions specified in its label.

As it contains bupropion, it also carries the antidepressant boxed warning for suicidal thoughts and behaviors in children, adolescents, and young adults.¹⁹

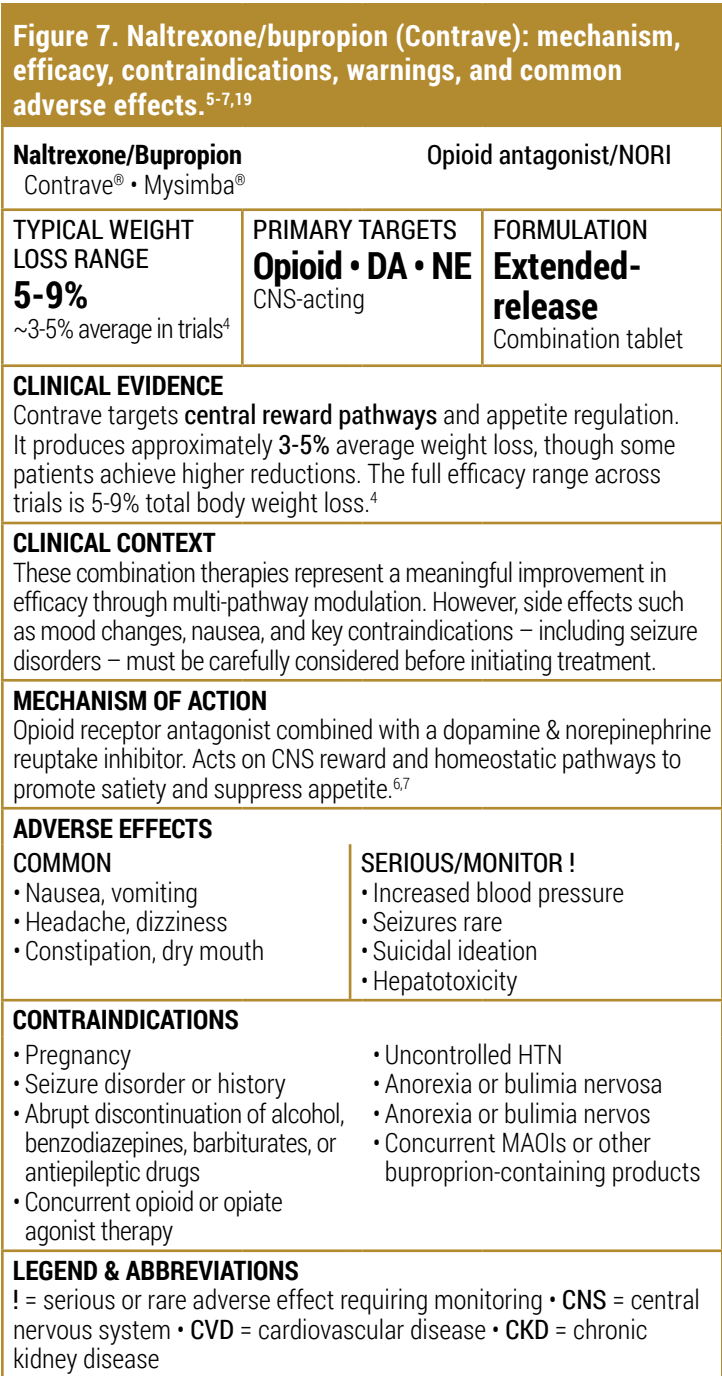
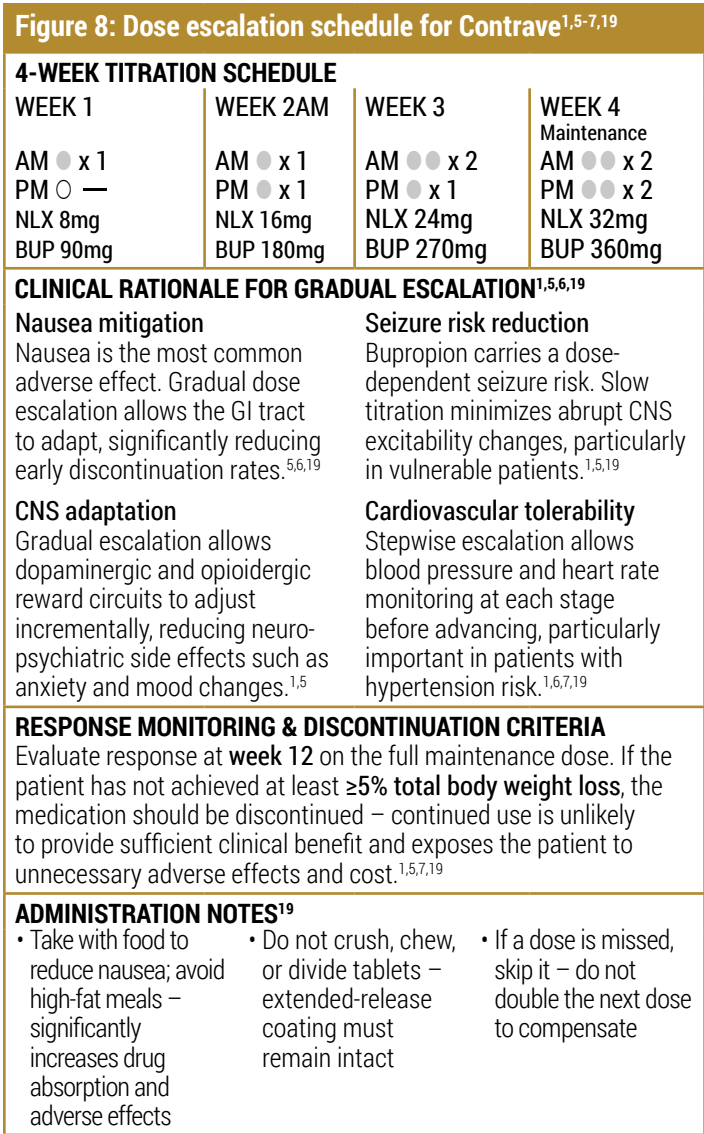


Figure 8 shows the **dose-escalation schedule for Contrave**. It requires a weekly step-up titration over the first month of treatment to limit the transient nausea and headache common at initiation.^{1,5-7,19}



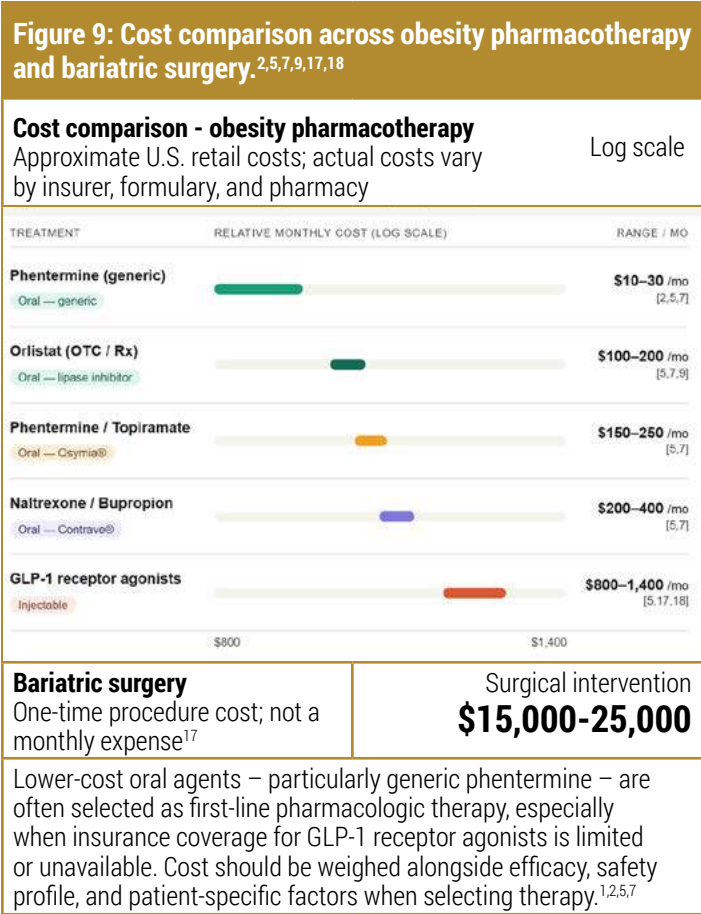
- Key takeaways on the combination agents:^{4-6,11,14,19,20}
- Qsymia generally produces more weight loss than Contrave because topiramate adds a separate central effect on GABAergic signaling.
 - Medication choice should not hinge on a simple “physical hunger vs. emotional eating” distinction. Eating patterns can guide the conversation, but comorbidities, contraindications, side-effect risk, concurrent medications, reproductive plans, and patient preference are more reliable guides.^{2,5,19,20}
 - Qsymia carries strict Risk Evaluation and Mitigation Strategies (REMS)¹¹ requirements tied to birth-defect risk (cleft lip/palate); Contrave carries a boxed suicide-risk warning tied to its bupropion component.^{11,19}
 - Contrave may suit patients for whom hunger and cravings are prominent, but is not appropriate for anyone on opioids and needs close attention to blood pressure, seizure risk, psychiatric symptoms, and drug interactions.^{5,19}
 - Both drugs include treatment-response checkpoints. If clinically meaningful weight loss is not achieved after the specified interval at the specified dose, the label directs dose escalation or discontinuation.^{19,20}

Cost, Access, and Treatment Selection

Cost often determines whether a reasonable treatment plan is sustainable. Insurance coverage, prior authorization requirements, discount programs, and pharmacy pricing vary widely, so the least expensive option for one patient may not be for another.^{2,5,7}

Some clinicians prescribe the individual generic components of a branded combination instead of the fixed-dose product. This approach is off label, does not automatically reproduce the pharmacokinetic profile of the fixed-dose extended-release product, and requires careful attention to formulation, titration, contraindications, and monitoring. It should not be presented as a simple one-for-one substitution.^{5,19,2}

Figure 9 below highlights the cost gap for obesity treatments in the United States. Generic phentermine is among the least expensive options, costing roughly \$10–30 per month, while GLP-1 injectable medications can cost \$800–1,400 per month. Bariatric surgery, although typically a one-time expense, can cost approximately \$15,000–25,000. This difference in cost is clinically important because many patients either lack insurance coverage for newer obesity medications or face high out-of-pocket expenses, making lower-cost options a more accessible first step.^{2,5,7,9,17,18}



When medication proves ineffective, poorly tolerated, inaccessible, or insufficient for the degree of weight loss a patient’s health requires, bariatric surgery should enter the conversation. It remains the most effective intervention, producing substantially greater and more durable weight loss than pharmacotherapy, though it carries operative risk and requires lifelong follow-up.^{1,2,17}

Conclusion

Oral non-GLP-1 medications have a place in obesity care. They are less effective on average than newer GLP-1 therapies or bariatric surgery, but they can offer real advantages in cost, access, route of administration, or fit with a patient’s other conditions and preferences.^{4,5,17}

No single medication works for every patient. The right choice depends on the biology driving the disease, how much weight loss a patient needs, contraindications, side-effect risk, reproductive plans, mental health, treatment burden, and what a patient can afford. A sound plan sets clear expectations for monitoring, dose escalation, response assessment, and when to stop a medication that is not helping.^{1,2,5,19,20}

As treatment options expand, the focus should remain on patient-centered care that reflects the chronic and complex nature of obesity.^{1,2,5}

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Obesity is Only the Façade – Master the Mind, Master the Mirror

Mysa Abdelrahman, MD and Ani A. Bodoutchian, MD, MBA, FAAFP

Introduction

Obesity is a complex public health crisis in the United States, driven by a multifactorial blend of biological, behavioral, and psychosocial determinants. A well-documented bidirectional link exists between obesity and mental health outcomes.¹

The prevalence of hyper-palatable foods—high in sugar, fat, and salt—frequently triggers reward-driven eating. Consequently, individuals with obesity face a heightened risk for depression, anxiety, and body image disorders, often accompanied by shame and low self-esteem fueled by societal stigma. This chronic condition creates a debilitating cycle: psychological distress hinders weight loss by driving emotional eating and decreasing motivation, which can progress into binge eating disorder or food addiction.^{2,3} In these cases, individuals may lose control over consumption despite recognizing the adverse consequences.⁴ Ultimately, the stigma of living with obesity exacerbates mood disorders, creating a persistent feedback loop between physical and mental well-being.^{5,6}

Shifting from “Willpower” to Biology

Clinical perspectives must shift from viewing body weight through the lens of “willpower” toward a model that recognizes the interplay between biological systems and mental health. Obesity and psychological distress are not independent; in fact, they are interdependent and reinforce one another.^{7,8}

Distress can alter metabolic activity and eating behaviors, while the physical and emotional burdens of the condition exacerbate systemic stigmatization.^{7,9} By prioritizing biological drivers, clinicians can more effectively address the underlying systems governing behavior.¹⁰

Pediatric research highlights that mental health comorbidities are deeply embedded in the pathology of youth obesity.^{11,12} Data correlate obesity in children and adolescents with higher incidences of depression, anxiety, ADHD, and binge-eating disorders, suggesting a broad spectrum of psychological vulnerabilities.^{13,14,15} Furthermore, early-onset disordered eating and emotional dysregulation contribute to suboptimal treatment outcomes and diminished self-esteem, potentially scarring a young adult’s long-term health trajectory.^{16,17,18}

On a population level, the global rise in obesity correlates with increased rates of major depression, dysthymia, and generalized

anxiety, particularly in women and those with severe obesity.⁷ The emergence of effective weight-loss medications further reframes obesity as a chronic biological condition. While this shift reduces personal shame, it introduces new challenges, including shifting body identities and the emotional adjustment to pharmacologically assisted change. Understanding the complexities of brain chemistry and stress responses allows for a realistic, integrated approach to care.^{19,20,21}

Stigma and Bias

Beyond its economic toll, obesity is deeply intertwined with a “weight-bias cycle.” This occurs when the very resources individuals need—medical care and social support—become sources of trauma.^{22,23} Stereotyping in clinical settings fuels a cycle of shame and social isolation. Weight-based stigma is directly associated with increased risks of depressive symptoms, substance use, and heightened stress levels, impacting the total health of the patient.^{7,24}

The Double-Edged Sword of the GLP-1RA Wave

Glucagon-like peptide-1 receptor agonists (GLP-1RAs) are reshaping obesity management. Because GLP-1 receptors exist in brain regions controlling behavior, these medications effectively reduce cravings and eliminate “food noise.”^{25,27} However, the experience is not always positive. For some, these medications may precipitate depression or anxiety. A proposed mechanism suggests GLP-1RAs may interfere with the dopaminergic system, potentially depleting dopamine in the brain’s reward center.^{25,27}

Establishing a direct causal link is difficult due to the reciprocal nature of metabolic and mental health. Factors such as family history, life stressors, or co-occurring medications play significant roles.^{26,27,28} Additionally, these medications exhibit a “ceiling effect,” where benefits may plateau. Patients should be prepared for the potential return of behavioral food noise or weight rebound upon discontinuation.^{26,27}

The Importance of Behavioral Health

In this evolving landscape, psychologists, dietitians, and obesity specialists are essential. They help patients develop sustainable habits and manage the emotional “rollercoaster” of rapid physical



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transformation.²⁷ Because the brain serves as the metabolic command center, it governs everything from hunger signals to emotional states. Even without immediate physical symptoms, excess weight can disrupt neural pathways responsible for metabolism and well-being.²⁹

Since sleep, exercise, and stress management directly shape biological functions, successful strategies must be holistic.^{30,31} By pairing medical weight loss with psychological tools, individuals can rewire the emotional cycles that sustain the struggle with weight, ensuring a comprehensive approach to long-term health.³²

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Approaching Global Obesity Prevention and Management Using Cultural Humility for Individualized Care

By Mary Rose Puthiyamadham, MD; Diane De Los Santos, MD; Basmah Rana, MD; Rebecca Collins, DO, MPH; Ruchi Mathur, MD, MPH, and Samantha Cardoso, MPA

Introduction

Obesity poses a significant and escalating global health crisis affecting every country. No nation has achieved a sustained reduction in obesity prevalence, and few are on track to meet targets established by the World Health Organization to halt the rise in obesity relative to 2010 levels.¹ In the U.S., being categorized as overweight and obese remains highly prevalent, with severe obesity (body mass index [BMI] ≥ 40) representing a growing and high-risk subgroup.² The rapid increase of childhood obesity is particularly concerning as it poses long-term challenges for prevention and reversal.³ Approximately one in five children and adolescents are affected by obesity, indicating substantial and long-term implications for population health.⁴ Beyond health outcomes, obesity imposes a considerable economic burden, with billions of dollars in annual healthcare and productivity costs.⁵

A major driver of the obesity epidemic is the widespread availability of inexpensive, energy-dense, and nutritionally poor foods. This shift reflects a broader global transition in dietary patterns and physical activity, often referred to as the “nutrition transition.”⁶ Historically, undernutrition was the dominant concern; however, many populations now experience a dual burden in which obesity coexists with food insecurity and undernutrition.⁷ When traveling to Honduras, the impact of obesity was prevalent. A bottle of Coca Cola was cheaper than water and often given liberally with meals. In the Dominican Republic, we, as health workers, gave out ham and cheese sandwiches alongside popsicles to those who sought care. Agricultural policies favoring commodity and cash crops have encouraged the production of inexpensive processed foods, high in sugars and refined carbohydrates, which researchers linked to the global rise in obesity and diet-related disease.⁸

After three pregnancies and battling my own experience with obesity, I have never been able to return to my baseline weight. Each child gifted me an additional 15 pounds, leaving me to think, “how was an American physician of South Asian descent, practicing in a Latino/Hispanic community, while struggling with obesity herself, supposed to help her patients?” It became clear that I would need help from others.



In healthcare, cultural competence is the ability to deliver care that aligns with patients’ cultural values and contexts. It is essential for improving engagement, adherence, and outcomes.⁹

Standardized interventions often do not address diverse populations’ needs and may contribute to health inequities. Therefore, integrating

culturally tailored strategies into clinical and public health

interventions is critical for achieving sustainable and equitable impact. Obesity is

a chronic illness that requires

multimodal treatment, along with deeper understanding, compassion, and encouragement.

This article will discuss the three diverse cultural approaches to support clinicians on counseling their patients within the culture that motivates their eating behaviors and dietary patterns.

South Asian Culture

Dr. Basmah Rana

The first step in caring for South Asian patients is understanding their unique cultural context and the barriers that may affect their health. Family medicine physicians are at the forefront of bridging care gaps, providing culturally responsive care, and empowering patients to make sustainable changes.

In many South Asian households, food is closely tied to caregiving, hospitality, identity, and family roles. A patient may describe her routine by saying, “I cook for my family, I feed my family, and then I eat their leftovers.” This reflects how caregiving expectations may influence eating behavior, self-care, and the ability to prioritize personal health.

South Asian culture is often collectivist, placing the needs of the family and community above those of the individual. From an early age, children may be encouraged to focus primarily on academics, while adults may prioritize financial stability, caregiving, and meeting the needs of the household. These expectations can contribute as barriers to lifestyle change, including limited early exposure to structured exercise, increased screen time, demanding work or academic schedules, and safety concerns related to outdoor activity.¹⁰⁻¹¹

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Physicians should inquire about patients' family and societal roles, household decision-making, caregiving responsibilities, and expectations surrounding food preparation, as these factors may influence both dietary and physical activity choices. Many South Asians may identify strongly through roles such as daughter, mother, wife, father, or provider before considering their own individual needs. Therefore, individual dietary change may feel like a selfish act and a sense of abandonment of family and cultural identity.

Although South Asian diets are diverse and include both vegetarian and non-vegetarian patterns, common features may include high carbohydrate intake, high saturated fat intake from cooking oils or ghee, and overconsumption of sweetened foods and beverages.¹² Like any immigrant group, a combination of the above patterns and an inclusion of the Western diet pattern contributes to abdominal adiposity.¹³

The second step is learning to assess risk appropriately. South Asian ancestry is a known high-risk demographic group and considered a risk-enhancer.¹⁴ They have significant mortality risks starting at BMI less than 30, due to higher proportions of visceral and hepatic fat, lower overall lean muscle mass, and higher waist-to-hip ratios. These differences contribute to increased rates of insulin resistance and Type 2 diabetes, even among individuals who may not meet traditional definitions of obesity.¹⁵ Newer guidelines also emphasize an elevated risk for atherogenic dyslipidemia, who have some of the highest concentrations of Lipoprotein A with 25% >50 mg/dL.¹³

For this reason, clinicians are encouraged to investigate beyond BMI alone and consider waist circumference, body composition, family history, metabolic markers, dietary patterns, and physical activity. Recognizing these risks early allows family medicine physicians to provide timely screening, counseling, and culturally tailored recommendations, including a greater emphasis on regular physical activity.

The third step is making changes through a patient-centered and family-centered approach. Clinicians are encouraged to motivate patients that caring for others and fulfilling family responsibilities does not exclude patients from caring for themselves. Rather than asking patients to work against their cultural values, physicians can build upon the natural strengths of family connection and shared responsibility.

Like the saying, "The family that prays together stays together," healthy behaviors can be reframed as, "The family that plays together stays together" and "The family that eats well together stays well together." Encouraging family members to make changes together can reduce isolation, strengthen support, and make new habits easier to maintain.

Clinicians can help by normalizing physical activity and recommending realistic options, such as walking after meals, home-based exercise, or women-only spaces when preferred for those patients who may have not had access to exercise in their childhood.¹⁰ Additionally, clinicians can encourage the retention of traditional foods by advising on practical modifications, such as baking or air-frying instead of deep-frying, reducing salt and sugar, increasing fiber and protein, adjusting portion sizes, and making healthier choices when eating out.^{10,16}

In summary, by recognizing cultural identity, assessing risk appropriately, and engaging the family as a source of support, family medicine physicians can help South Asian patients make meaningful changes without asking them to abandon the foods, traditions, and relationships that are central to their lives.

Latino/ Hispanic Culture

Dr. Diane De Los Santos

Obesity prevention and management within the Latino/Hispanic population entails providing effective care requiring cultural humility and recognition that health behaviors are shaped by cultural values, migration experiences, socioeconomic realities, and family dynamics. Clinicians seeking to understand the patient's lived experience are encouraged to collaborate with families in a culturally respectful manner.

The first step in caring for a Latino/Hispanic patient with obesity is identifying patient concerns and barriers before offering recommendations. Many families face structural challenges including long work schedules, limited childcare, transportation difficulties, food insecurity, and limited access to affordable healthy foods.¹⁷ For many immigrant families, daily survival and stability may take precedence over health goals. Open-ended questions such as, "What challenges do you face eating healthy as a family?" or "What challenges do you face staying active as a family?" encourage trust and allow clinicians to better understand these barriers. Research from culturally adapted obesity intervention programs found that Latino/Hispanic families frequently requested assistance with childcare, transportation, and access to health and social services.¹⁸ Families also expressed interest in learning about safe walking routes, affordable grocery stores, and healthy cooking strategies using culturally familiar foods.¹⁸ Addressing these concerns acknowledges that health behaviors are strongly influenced by environmental and socioeconomic realities rather than motivation alone.

The second step is understanding patients' perceptions of health, food, and body weight. In many Latino/Hispanic communities, cultural beliefs surrounding weight may differ from dominant Western medical perspectives.¹⁹ Some families associate thinness with illness or malnutrition while viewing a heavier child as healthy and well cared for. Parents may also believe children will "grow out" of obesity or that weight is primarily genetically determined. Because of these beliefs, immediately labeling a child as "obese" may create shame or mistrust. Instead, clinicians can frame discussions around emphasis on improved energy, sleep, physical wellbeing, and family health which can foster rapport while shifting the conversation away from blame.¹⁸⁻¹⁹

Clinicians are encouraged to explore the cultural meaning of food within the family. In many Latino/Hispanic households, food represents love, comfort, celebration, and connection. Eating may additionally serve as a coping mechanism for emotional distress, reflected in the phrase "las penas con pan son menos" ("grief is lessened by bread").¹⁷ Some parents may use sweets or fast food as rewards for good behavior as an expression of care and affection.²⁰ Understanding the reasoning behind these practices is essential before attempting behavioral change. Immigration and assimilation may also influence dietary habits.¹⁹ Many immigrant families

gradually replace traditional diets with processed and fast foods common in the U.S. due to time constraints, convenience, affordability, and perceptions that eating “American” foods represents modernization or assimilation. Validating these challenges while emphasizing that traditional Latino/Hispanic foods can remain part of a healthy lifestyle is a solid approach clinicians can adopt since traditional Latino/Hispanic diets often include nutritious foods such as beans, vegetables, fruits, and lean proteins.¹⁷ Clinicians can focus on healthier preparation methods, portion sizes, and ingredient choices within familiar meals and ingredients rather than counseling with unfamiliar foods.

The third step is recognizing the importance of family and community within Latino/Hispanic culture as individual patients are driven by family-centered thinking and decision-making to support many life choices, leading to family-centered interventions being more effective than individual approaches. Latino/Hispanic patients often prefer facilitated group discussions where families can share experiences and learn collectively. Additionally, community-based interventions including walking groups, cooking classes using traditional foods, and supermarket tours may also be effective because of their practical, social, and culturally relevant nature.¹⁸⁻¹⁹

Finally, cultural humility requires adapting communication styles to patients’ literacy levels and language preferences. Educational materials should use simple language, visual illustrations, and minimal medical jargon.¹⁷ Programs delivered by trusted community health workers, such as “promotoras,” may further improve trust and engagement.¹⁸

Culturally humble obesity management within the Latino/Hispanic population requires relationship-centered care that acknowledges patients’ cultural beliefs, structural barriers, and family values. By understanding patient concerns, exploring cultural perceptions of food and health, and leveraging the strengths of family and community, clinicians can develop interventions that are both culturally respectful and clinically effective.

Western Culture

Dr. Rebecca Collins

Obesity prevention and management within Western culture requires recognizing that food choices are often shaped by an environment that prioritizes convenience, speed, low upfront cost, and highly palatable foods rather than long-term health. In the United States, many patients live in a food landscape saturated with ultra-processed foods (UPFs), oversized portions, restaurant meals, packaged snacks, and sugar-sweetened beverages, all of which make less nutritious choices easy and routine.²¹⁻²³ Culturally humble care in this setting requires acknowledging that eating patterns are influenced not simply by motivation or willpower, but by the broader food environment.

The first step in caring for patients influenced by Western dietary patterns is helping them understand and navigate their way around the typical American diet. Clinicians are encouraged to illustrate how the typical American diet is dominated by industrially formulated products made from substances extracted from foods, including refined starches, added sugars, fats, oils, and high-fructose corn syrup, often combined with additives that

enhance flavor, texture, and shelf life.²¹ The NOVA food classification system categorizes these foods as UPFs (ultra-processed foods), which are typically high in caloric density, low in nutrient density, engineered for hyper-palatability, associated with impaired satiety, and may negatively affect the gut microbiome.^{21,24-26} National data show that among Americans aged 1 year and older, 55% of calories come from UPFs, with sandwiches, sweet bakery products, savory snacks, and sweetened beverages among the top contributors.²² By guiding and coaching patients on how the American diet is specifically designed to encourage frequent consumption and make fullness harder to recognize, clinicians can grow patient’s familiarity with healthier options and help reduce stigma around this type of food consumption.²⁵⁻²⁶ Using a resource like Table 1 can help guide patients to make gradual changes to their overall diet with simple but impactful substitutions that can ultimately foster a lifestyle and behavioral change to food consumption.

The second step is identifying patient-specific barriers to preparing, choosing, and acquiring healthier foods. Many patients may rely on takeout, food delivery apps, restaurant meals, or packaged foods often due to varying personal obligations that may limit their time to consider and acquire healthier food options. When patients choose less healthier or convenient foods, this choice carries hidden costs in the form of excess calories, sugar, sodium, and long-term health consequences.^{25,27} National data continue to show a high prevalence of obesity among U.S. adults, underscoring the health impact of these dietary patterns.²⁸ When clinicians are motivating patients to alter their dietary patterns, they can pose open-ended questions such as, 1) “What meals are hardest for you to plan during the week?” 2) “When do you most often need something quick?” or 3) “What are some healthier alternatives to the services you currently use or restaurants you order? Are there healthier modifications you can select?” By asking these sample questions, clinicians and patients can uncover the situations in which patients are most likely to rely on less nutritious foods.

These conversations create an opportunity to introduce meal planning as a practical, preventive strategy. Although meal planning requires some upfront effort, it may save time, money, and decision-making stress over the course of the week while supporting healthier eating patterns. Meal planning has been associated with improved diet quality and healthier weight status, and more frequent home cooking has been associated with both better diet quality and lower food expenditures.^{23,29} Clinicians can suggest having their patients choose 2 or 3 simple and easily prepared weekly dinners to better guide their grocery shopping purchases while also suggesting the purchases of staple ingredients to keep on hand that can easily be turned into quick but healthy meals, such as eggs, beans, frozen vegetables, whole grains, and yogurt. Another helpful strategy is recommending that patients cook once and plan for leftovers, so one evening meal can become the next day’s lunch or an easy second dinner later in the week.²⁹

Once clinicians understand their patients’ motivations and specific barriers behind their dietary patterns, the third step is helping patients make manageable changes that fit within their existing routines. Clinicians can promote and emphasize gradual additions and substitutions that improve satiety and reduce

reliance on UPFs instead of asking patients to eliminate all convenience foods.

In Western dietary counseling, practical areas of focus include hydration, protein, and fiber. Adequate hydration supports health, metabolic function, and satiety, while sugary beverages contribute excess calories with little nutritional value.³⁰ Clinicians can offer practical suggestions include drinking a glass of water upon waking, having water before meals, carrying a reusable water bottle, and gradually replacing soda or other sweetened drinks with water or unsweetened beverages, which are all strategies to increase a patient's water intake and decrease consumption of sugar-sweetened beverages.

Increasing protein intake is another helpful strategy, as protein promotes satiety, supports lean mass preservation, and may assist with weight management.³¹ Patients can be encouraged to choose higher-protein breakfasts such as eggs, Greek yogurt, or a protein smoothie instead of pastries or sugary cereal. Additional practical suggestions include keeping protein-rich snacks such as nuts, cottage cheese, or yogurt available and incorporating beans, lentils, tofu, chicken, or fish into meals.

Lastly, increasing fiber intake can improve satiety, support body weight regulation, and benefit gut and metabolic health.³² Simple counseling suggestions include switching from white bread or pasta to whole grain options, adding legumes to soups or salads, incorporating vegetables into lunch and dinner, replacing processed snacks with fruit, and adding chia or flax seeds to yogurt or oatmeal. All of these suggestions can be coupled with conversations around meal preparation and grocery shopping guidance.

In summary, culturally humble obesity management within Western culture requires recognizing that many patients are trying to make healthy choices within a food system that favors ultra-processed, convenient, and calorie-dense options. By helping patients understand their food environment, identifying barriers such as time pressure and reliance on convenience foods, and encouraging realistic strategies including meal planning, hydration, and increased protein and fiber intake, clinicians can support changes that are practical, sustainable, and protective of long-term health.

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Table 1. Promoting Healthy Nutrition by Addition and Substitution Across Cultures				
		Latino/Hispanic Culture	South Asian Culture	Western Culture
Protein 	Beans, Legumes, Seeds, Nuts	• Black and pinto beans (frijoles) • Lentils (lentejas) • Chickpeas(garbanzos), • Pumpkin seeds (pepitas)	• Almonds • Chia seeds or flaxseeds (alsi) • Chickpeas (chana) • Daal (masoor, moong, toor); Consider whole instead of split for more fiber; can be sprouted or stewed, • Kidney beans (rajma)	• Black, cannellini, kidney, and fava beans, • Cashews, almonds, and pine nuts • Chickpeas • Green beans • Greek yogurt or cottage cheese • Sesame, flax, or chia seeds
	Poultry, Eggs, and Dairy	• Chicken (pollo); Grilled, baked, or stewed • Eggs (huevos); scrambled with vegetables (huevos rancheros) • Low fat dairy: yogurt, queso fresco, Oaxaca cheese (Lacteos) • Low fat or fat-free milk, (leche baja en grasa o sin grasa)	• Chicken, curd, raita; baked or stewed and prepared with blended high-protein Greek yogurt or cottage cheese, egg curry, egg burji	• Chicken, turkey, hen; baked • Omelets and quiches made with vegetables and cottage cheese
	Fish & Seafood	• Fish tacos • Salmon; baked • Shrimp ceviche (pescado, mariscos) • Tilapia; grilled	• Fish; steamed or wrapped in a banana leaf • Sardines • Shrimp, prawns • Tiger fish	• Cod • Halibut • Salmon • Scallops • Shrimp • Tilapia • Tuna
	Soy-based/ Alternative		• Edamame • Soya chunks • Tofu curry or blend tofu into roti batter to add protein	• Edamame • Tempeh • Tofu

Table 1, continued

		Latino/Hispanic Culture	South Asian Culture	Western Culture
Fiber 	Whole Grains	• Brown rice/whole Grains (pan integral) • Whole corn tortillas (tortillas de maiz); for tacos, enchiladas, tostadas • Whole grain bread (arroz Integral)	• Almond flour; mixed in curries • Brown rice, millets, jowar, bajra, and ragi • Flax or chia seeds; mixed in raita or roti • Whole wheat flour (atta)	• Couscous and whole grain pastas • Oats • Polenta • Wheatberries • Whole grain rice, barley, buckwheat, bulgar, farro, and millet • Whole grain bread
	Vegetables (Tip: focus on adding the colors of the rainbow)	• Cactus paddles (nopales), Chayote, squash (calabaza); Grilled, sauteed, in salads, or added to eggs or tacos • Tomatoes, peppers, avocado (verduras)	• Cucumber, tomato, and onion mix (kachumber)â, cabbage • Cauliflower • Eggplant • Fresh or dried leaves (methi) • Green beans • Green peas • Okra (bhindi) • Peppers (capsicum) • Spinach (paalak) • Zucchini	• Beets • Broccoli • Brussel sprouts • Cabbage • Spinach, kale, arugula, collard greens, and mustard greens • Sweet potatoes • Zucchini
	Fruits	• Avocado • Guava • Mango • Papaya • Pineapple	• Banana • Cantaloupe • Guava • Jackfruit • Lychee • Mango • Papaya • Plums • Pomegranate • Watermelon	• Apples and pears • Apricots and peaches • Cherries • Dates and figs • Grapes • Grapefruit, clementines and oranges • Melons • Pomegranates • Strawberries and blueberries
Beverages 	Water	• Agua	• Pani	Water
	Homemade beverages without added sugar	• Coffee (café) • Fruit/vegetable infused water (agua fresca) • Herbal teas: chamomile (manzanilla), cinnamon (canela), flaxseed (linaza), hibiscus (jamaica)	• Chai; prepared with cardamom, cloves, and cinnamon to sweeten • Coconut water • Green tea • Indian-styled lemonade (shikangi) • Lemon and honey water • Mango drink (aam panna) • Nimbu pani, lassi or mattha made with Greek yogurt and fruit, buttermilk (chaas) • Turmeric milk (haldi doodh)	• Lemonade; made with minimal sweetener like honey • Seltzer or regular water infused with fruit • Unsweetened teas and coffee

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Across cultures, food is an integral part of health and life. With immigration across borders at an all-time high globally, we, as family physicians who care for individuals in the context of their families and communities, have an opportunity to make a multigenerational impact on the obesity epidemic. Providing culturally sensitive nutrition recommendations in the context of individual behavior and values can create sustainable changes and a lasting impact on health outcomes.⁵⁷ We have a responsibility to better understand the individuals and communities we serve in efforts to advise on modifications and additions to the foods they are accustomed to eating in order to meet their health goals. As noted, adding protein, fiber and hydration will lead to prolonged satiety and decreased consumption of less nutritionally dense foods. For nutrition recommendations in specific cultural contexts, family medicine physicians are encouraged to utilize Table 1 as a resource to shift the conversation about weight and food toward the continuation of enjoyment of foods that are part of who we are without compromising our health goals.

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Food as Medicine: Integrating Culinary and Cultural Approaches into Obesity Care for Family Physicians

By Marissa Toussaint, MD, MPH, FAAFP

Introduction

Obesity is a complex, multifactorial, chronic, relapsing disease that requires a multi-pronged approach, for which therapeutic interventions include lifestyle, behavioral counseling, pharmacotherapy and surgery. Despite its prevalence, obesity remains substantially undertreated;¹ family physicians are well-positioned to manage obesity longitudinally in the primary care setting. Yet, many lack the training to counsel patients on appropriate nutrition interventions for effective weight loss and metabolic health improvement.

Nutrition education in US medical education has long been inadequate. A review of nutrition learning experiences across US medical schools found that despite the well-established relationship between diet and chronic disease, medical education has provided minimal structured nutrition training.² From this gap, many family physicians enter into practice without formal training in evidence-based nutrition counseling.

These gaps are amplified in culturally diverse populations, including Black, Caribbean and Hispanic communities, who face disproportionately high rates of obesity and metabolic disease,^{3,4} yet are underrepresented in nutrition research.⁵ South Asian populations experience cardiometabolic disease at lower body mass index (BMI) thresholds and also require targeted dietary strategies.⁶ This article focuses on adult obesity care in the primary care setting and offers family physicians a practical framework for incorporating culinary medicine and culturally responsive nutrition counseling into routine visits.

Dietary Patterns and Cultural Context

Dietary pattern studies have demonstrated modest improvements in weight and cardiometabolic risk factors with the Mediterranean, DASH and low carbohydrate diets.^{7,8} These patterns are well-studied and clinically useful but were not designed around the food traditions of many US populations. Standardized dietary models, therefore have limited cultural specificity. A recent perspective article highlighted that while the Mediterranean diet possesses robust evidence, traditional Latin American, Asian and African heritage diets remain significantly understudied, despite having many health-promoting characteristics.⁵ Counseling framed exclusively around standardized dietary models may reduce patient engagement when recommendations conflict with culturally significant eating patterns.

Another limitation is the widespread availability and consumption of ultra processed foods (UPF). A randomized

controlled trial demonstrated that ultra processed diets lead to higher caloric intake and weight gain compared with minimally processed diets, even when macronutrient profiles are matched.⁹ This suggests that food processing and palatability influence intake beyond nutrient composition alone.

Food insecurity further constrains dietary choice. It is defined as having inconsistent access to sufficient quantities of healthy food and it disproportionately affects Black and Hispanic households in the United States.¹⁰ For patients in food-insecure households, generic dietary guidance to reduce processed food consumption or increase fresh produce intake may not be feasible without first addressing the structural barriers shaping their food environment. Nutrition counseling that fails to account for socioeconomic and cultural context is therefore unlikely to produce sustainable behavior change.

Evidence for Dietary Interventions

Culinary medicine has emerged as a structured clinical approach that translates evidence-based principles into practical strategies in the kitchen. A pilot study of the Teaching Kitchen Collaborative Curriculum evaluated a hands-on, food-based lifestyle intervention for adults with obesity and found that it was feasible to implement in a clinical education setting, was well received by participants and associated with short-term improvements in dietary behavior and modest weight changes.¹¹ These findings suggest that experiential cooking-based interventions may influence real-world eating patterns, although current evidence is limited by small sample sizes and a lack of long-term comparative outcome data.

Community based nutritional interventions often incorporate cultural tailoring, while medical education has been slower to adopt culturally relevant nutrition training, highlighting a gap in physician preparedness.¹² Culturally tailored dietary interventions are associated with improved dietary intake and in some studies, favorable changes in body composition and cardiometabolic risk factors. The 2025 Dietary Guidelines Advisory Committee Evidence Scan identified 178 controlled trials, most reporting dietary improvements and variable clinical outcomes, with the largest body of evidence in Black and Hispanic populations.¹³

Smaller studies in Mexican American women show improved engagement and weight related outcomes when interventions incorporate culturally familiar foods and household level behavioral strategies.^{14,15} Qualitative work highlights acculturation, family structure and food environment as key determinants of dietary behavior.¹⁶

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A scoping review on the cultural relevance of culinary and nutritional medicine interventions found that most existing programs failed to adequately incorporate culturally relevant topics into their design, despite the disproportionate burden of diet-related chronic disease among racial and ethnic minority groups.¹² This gap suggests that standardized nutrition resources may not adequately address the needs of culturally diverse patient populations.

Overall, evidence supports both general dietary pattern efficacy and the added value of culturally adapted implementation strategies.

A Practical Framework for the Clinical Visit

Effective nutrition counseling can be integrated into routine primary care without specialized nutrition training. What is needed is a structured shift in the way nutrition conversations begin, one that gathers meaningful information before dispensing advice.

Eliciting Dietary History

A closed-ended question such as: *‘How is your diet?’* rarely elicits clinically useful information. A more effective assessment begins with understanding a patient’s usual eating patterns, culturally important foods and household food dynamics. Key questions include:

- ‘What does a typical day of eating look like for you?’
- ‘What foods are most commonly eaten in your household?’
- ‘Are there foods from your culture or family traditions that are important to you?’
- ‘Who in your household does most of the cooking and grocery shopping and do they have any health concerns I should know about?’

Food insecurity screening should be routine. The Hunger Vital Sign™ is a validated two-question tool used to identify food insecurity in clinical settings:¹⁷

- ‘Within the past 12 months, we worried whether our food would run out before we got money to buy more.’
- ‘Within the past 12 months, the food we bought just didn’t last and we didn’t have money to get more.’

A positive response to either item indicates a risk of food insecurity.

Dietary assessment should also account for household decision making. In many cultural contexts, food choices are shared among family members, limiting the impact of individual advice.

For patients with limited English proficiency, these conversations require additional attention. Whenever possible, a trained medical interpreter should facilitate discussions.¹⁸ Professional interpreters improve communication, quality of care and patient satisfaction. Ad hoc interpreters, including family members may unintentionally introduce omissions, inaccuracies or biases that affect the accuracy of communication.

Assessing Dietary Context

Once baseline intake is understood, counseling should identify which elements of the existing diet are assets, what foods are

nutritious or culturally meaningful and which create metabolic friction. Physicians should resist the urge to categorize traditional cultural foods as problems to be eliminated. Preparation methods, portion size and food frequency often have a larger influence on dietary impact than focusing on individual foods in isolation.

Acculturation is associated with declining dietary quality in immigrant populations as traditional foods are replaced by more processed foods.¹⁶ Identifying whether a patient has drifted from their cultural food traditions (and why) can also reveal important leverage points for intervention.

Counseling Strategies for Dietary Change

Restriction-based dietary counseling is associated with poor long-term adherence in patients. A more effective framework focuses on what can be added or modified rather than eliminated:

- Adjust preparation methods to reduce added fats, sodium or sugar while preserving flavor profiles
- Add culturally familiar vegetables, legumes or grains to familiar dishes
- Identify one specific, concrete change per visit rather than a comprehensive dietary overhaul

The goal of a primary care visit is a single actionable change that aligns with the patient’s capacity.

Motivational Interviewing and Goal Setting

Physicians should offer nutrition counseling even when pharmacologic interventions are used. Motivational interviewing is a patient centered communication approach with evidence in obesity care. While its independent effect on weight loss outcomes has been modest in clinical trials, its value in obesity care lies in its ability to elicit intrinsic motivation, reduce shame and sustained readiness for change.^{19,20}

Once motivation is established, behavior change goals should be translated into small steps using SMART goals that are specific, measurable, achievable, relevant and time-bound.

Addressing Common Cultural Perceptions

Family physicians should be aware that cultural beliefs may influence patient perceptions of body weight.²¹ When discussing obesity, physicians should distinguish health risk from appearance and avoid framing weight management in aesthetic terms. Exploring a patient’s personal health goals and concerns may be more productive than focusing exclusively on BMI. A culturally sensitive approach acknowledges and respects diverse body ideals while framing discussions around clinically relevant outcomes such as cardiovascular and diabetes risk, hypertension, sleep apnea, osteoarthritis and quality of life. This allows physicians to address obesity-related health concerns while remaining respectful of cultural values.

For many cultures, traditional foods may be viewed as inherently healthy because the meals are homemade and use whole foods. While many traditional dietary patterns contain nutritious whole foods, health concerns may arise from portion size, preparation

methods, excess sodium, added sugars; or an imbalance of vegetables, protein and starches. Rather than labeling foods as “good” or “bad”, physicians should acknowledge the cultural significance of these foods and discuss dietary patterns using neutral, non-judgmental language with an affirming tone.

A Sample Clinical Dialogue

The following exchange illustrates how the framework above might unfold in practice:

Physician: Would it be okay if we spent a few minutes talking about your weight and how it may be affecting your health?

Patient: Sure.

Physician: I want to be clear that I’m not talking about appearance or body size preferences. My concern is that excess weight can increase the risk of conditions like diabetes, high blood pressure, osteoarthritis and sleep apnea. Even modest reductions in weight can improve outcomes. How do you feel about your current weight and health?

Patient: I know I’ve gained weight over the years. But in my family, a bigger body size has never really been seen as a problem. I have started noticing that my knees and back hurt when I walk for long periods and I get winded more easily than I used to.

Physician: I understand. You are holding two truths: the way your family views body size and the fact that your body is starting to feel different now. What would you like your walking and energy to feel like going forward?

Patient: I just want to be able to get through the day without feeling tired all the time. And I want to walk without my knees bothering me so much

Physician: People often have different cultural and family perspectives about body size. I’m not here to challenge those. I’m focused on understanding your routine and what might help your knees, back and energy. Would it be okay if we talked about some of the foods that are commonly eaten in your home so I can have a better understanding of your eating pattern?

Patient: Yes.

Physician: Walk me through what you eat on a typical day.

Patient: I usually have eggs in the morning. Lunch is sometimes rice and chicken from the spot near work. For dinner I cook, usually rice and beans, some kind of stew, maybe plantains.

Physician: Thank you, that gives me a clear picture. Are there dishes that feel important to you — things from your family or your culture that you wouldn’t want to give up?

Patient: The stew. My mother taught me. I make it every Sunday.

Physician: I’m sure that stew carries special meaning for you. I’m not going to ask you to give that up. I do want to ask — when you make the stew, do you use a particular cut of meat?

Patient: Usually oxtail or pork shoulder.

Physician: Those are flavorful cuts. One thing we could explore is whether a leaner cut of meat (like skinless chicken thighs with the bone) or skimming the fat after cooking, could give you similar flavor with less saturated fat. Or we could try looking at some plant protein alternatives, such as tofu. Would that be something you’d be willing to try once and see?

Patient: I could try a leaner cut. I dislike tofu.

Physician: What’s your favorite vegetable?

Patient: Well, I like carrots and sometimes spinach.

Physician: What if we added two chopped carrots to the stew and near the end, wilted a pound of chopped spinach in the broth? That would add beneficial fiber to it.

Patient: Hmm, interesting. I don’t mind trying that.

Physician: Perfect. Trying this modified stew recipe on Sundays will be our one goal for this visit. We’ll see how it feels when you come back.

This exchange demonstrates asking before advising, identifying a dietary asset worth preserving, suggesting a modification instead of elimination and collaborating on a single SMART goal, grounded in the patient’s values and readiness to change. Subsequent visits should build on prior success and collaboratively identify strategies for addressing challenges.

Clinical and Community Resources

- Patients who screen positive for food insecurity should be referred to community resources as part of clinical care. Find Help is a publicly available platform that connects patients to food assistance programs and social services by ZIP code with national coverage.²²
- Oldways provides culturally specific dietary education materials, including heritage diet pyramids for African, Latin American, Asian and Mediterranean food traditions.²³ These can be used as patient handouts.
- For additional education in culinary medicine, two established institutions offer structured resources. Health Meets Food provides online training modules designed specifically for healthcare providers.²⁴ The Teaching Kitchen Collaborative offers curricula and implementation resources in clinical and community settings.²⁵
- Referring patients to a registered dietitian with cultural competency in food traditions remains appropriate when available and accessible.

Conclusion

Obesity management in primary care requires practical and adaptable nutrition counseling strategies that account for cultural food practices and social determinants of health. Evidence from dietary pattern research supports multiple effective approaches, with outcomes driven largely by adherence and feasibility. Cultural tailoring and culinary medicine may improve engagement and

implementation. Family physicians can incorporate these principles into routine care through structured dietary assessment, motivational interviewing and incremental goal setting, supported by appropriate community resources. Additional resources in culinary medicine and culturally tailored patient education and food insecurity screening and referral may further support implementation in clinical practice.

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