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The Skinny on Weight Loss Supplements: Fact or Fantasy?

Introduction

Nowadays, it seems as though most Americans are trying to lose weight, and for good reason: about 97 million Americans are overweight or obese.^[1] These patients have increased risk of all-cause mortality, as well as increased morbidity from hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea, and other respiratory problems, as well as certain malignancies, such as cancers of the endometrium, prostate, and breast.^[1]

The National Heart, Lung, and Blood Institute and the National Institute of Diabetes and Digestive and Kidney Disease published guidelines for the treatment of overweight and obese adults.^[1] These recommendations are intended for patients with a body mass index (BMI) ≥ 30 , or ≥ 27 with obesity-related risk factors or diseases present. The guidelines recommend initial lifestyle modifications, including a reduced-calorie diet of 500-1000 calories per day, increased physical activity, and behavioral therapy. If these changes fail to produce a result in 6 months, approved pharmacotherapy is recommended as an adjunct in high-risk patients.

Prescription medications approved by the US Food and Drug Administration (FDA) for weight loss include: sibutramine (*Meridia*, by Abbott Laboratories), which inhibits the reuptake of serotonin, norepinephrine, and dopamine; orlistat (*Xenical*, by Roche Laboratories Inc.), a reversible inhibitor of gastric and pancreatic lipase; and phentermine, an adrenergic medication.^[2] Less commonly prescribed drugs include diethylpropion, benzphetamine, and phendimetrazine. Off-label medications for weight loss include newer antidepressants (fluoxetine, sertraline, bupropion) and novel anticonvulsants (topiramate, zonisamide).^[2] Bariatric surgery is recommended in cases of extreme obesity.

For many patients, exercise and a reduced calorie diet in addition to regular visits with their health provider is not only hard work, but also may also be a source of embarrassment. For these individuals, readily available herbs and dietary supplements that promise weight loss without a prescription are an attractive option.

These products are aggressively marketed to the public, and manufacturers claim they will produce significant weight loss without unwanted side effects. Yet, many of the ingredients have never undergone rigorous scientific testing, and claims about their effectiveness are often misleading.

Historically, sympathomimetic amines have been used as over-the-counter diet aids, including phenylpropanolamine, *Ma Huang* (ephedra), and ephedrine. However, these products became notorious for causing dose-related increases in blood pressure, which may not be problematic in healthy patients, but can be hazardous in others. When the use of phenylpropanolamine (*Acutrim*, by Amerifit Brands) was correlated with hypertension and stroke, the FDA banned it from the market in November 2000. Likewise, *Ma Huang* and ephedrine-containing supplements have been removed from the US market.

With the disappearance of these products, supplement manufacturers have struggled to bring a weight loss aid to market that is both safe and effective. Whenever media attention is given to a particular ingredient or supplement with potential thermogenic or appetite suppressant properties, overweight patients often are willing to give these products a try, even in the absence of properly conducted clinical trials.

Unfortunately, many patients fail to disclose their use of nonprescription supplements to their healthcare providers. Even if they did, many clinicians lack the training or expertise to analyze these therapies. In fact, it is not uncommon to hear a pharmacist tell patients, "We don't really have much evidence that this supplement will promote weight loss; however, it probably will not harm you."

The purpose of this review is to provide healthcare professionals with accurate information concerning the safety and efficacy of popular weight loss supplements, so that they can counsel their patients accordingly.

Orlistat

Orlistat is the only FDA-approved over-the-counter medication currently approved for weight loss. The drug selectively inhibits gastrointestinal and pancreatic lipase activity, resulting in a 25% to 33% reduction of dietary fat absorption.^[3] A lack of sympathomimetic activity and systemic adverse effects adds to the drug's appeal.

Orlistat has been available by prescription in a dose of 120 mg (*Xenical*), and it was recently approved in a 60-mg dose that is available over the counter (*Alli*, by GlaxoSmithKline). One capsule (60 mg) is taken 3 times daily with meals or shortly after. A reduced-calorie diet, smaller meal portions, and a maximum of 15 g of fat per meal are recommended by the manufacturer.^[4] Side effects are minimal, with most common adverse events being gastrointestinal, most often due to more fat consumption than is recommended. The 120-mg dose is well-supported by evidence, and the *Alli* Web site boasts similar efficacy and fewer side effects than *Xenical*. However, studies to support the half-strength dose are difficult to find.

In a multicenter, 16-week, randomized, double-blind, placebo-controlled study, 378 patients were treated with either orlistat 60 mg 3 times a day or placebo for 16 weeks.^[5] Patients also ate a reduced-calorie diet and were provided with self-instructional materials. Outcomes measured included changes in weight, BMI, waist circumference, blood pressure, and fasting lipoprotein and glucose levels. Patients in the treatment group had significant weight loss compared with placebo, along with improvements in several other measured outcomes.

According to the manufacturer, the 60 mg dose of orlistat demonstrated comparable efficacy and safety profiles to the 120-mg prescription capsule, including a lower drop-out rate due to gastrointestinal side effects.^[4] Additional claims include 81% patient satisfaction and 91% of patients reporting some weight loss.

Take-home message. Nonprescription orlistat can be recommended as an adjunct to a diet low in saturated fat. However, patients should be advised to expect only modest weight reductions: on average, only about 5% of initial body weight. Patients who exceed a daily intake of 30% dietary fat or more are likely to experience gastrointestinal side effects.

Bitter Orange, Chitosan, Chromium

Bitter Orange (*Citrus aurantium*)

The plant of bitter orange is also known as sour orange, Seville orange, or zhi shi. It contains synephrine, an indirect beta- and alpha-agonist with effects similar to ephedra. It is commonly used in dietary supplements since ephedra was withdrawn from the market.

In a 6-week double-blinded, randomized, placebo-controlled study, 23 patients with a BMI >25 were divided into 3 groups: bitter orange 975 mg plus caffeine 528 mg plus St. John's Wort 900 mg daily; maltodextrin; and a control group that received no supplementation.^[6] The subjects were instructed by a dietitian and participated in an exercise

program. Individuals in the bitter orange treatment group lost a modest amount of body weight (1.4 kg) and body fat (2.9%). No significant differences in mood state or adverse events were reported, including blood pressure, heart rate, electrocardiograph findings, serum chemistries, or urinalysis.

In a prospective, randomized, double-blind, placebo-controlled, crossover study, 15 young, healthy adults received either a 900 mg bitter orange supplement or placebo with a 1-week washout period.^[7] Outcomes measured were systolic and diastolic blood pressures and heart rate. Results showed that systolic and diastolic blood pressure and heart rate were elevated for up to 5 hours after 1 dose of bitter orange.

A case of ischemic colitis was reported in a 52-year-old female consuming a bitter orange-containing supplement for weight loss.^[8] Another case reported a 57-year-old male with variant angina after consumption of a bitter-orange containing weight loss supplement.^[9] A case report of a 55-year-old white female who had been taking 300 mg of bitter orange for a year discussed a myocardial infarction possibly associated with the supplement.^[10]

Take-home message. There is a paucity of evidence supporting bitter orange as an effective weight loss aid. This supplement can elevate heart rate and blood pressure. Thus, patients should probably avoid its use, especially those with a history of cardiovascular disease.

Chitosan

Chitosan is a derivative of a chitin found in shells of invertebrates, such as crabs and shrimp. It is touted as a "fat blocker." In one study, 7 healthy males consumed > 120 g fat per day for 12 days and took chitosan prior to meals and snacks on days 6 to 9 (15 capsules or 5.25 g chitosan per day).^[11] Fecal samples were collected on days 2 through 12 and were analyzed for fat content. Fat content of the feces did not change from the chitosan-free period, and the authors concluded that the chitosan did not block fat absorption.

In another study, 250 patients were randomized in a 24-week, double-blind, placebo-controlled trial to receive 3 g chitosan per day or placebo.^[12] Chitosan treatment did not result in a clinically significant loss of body weight or a significant difference in adverse events.

In a study of 12 women and 12 men, participants followed customized diet plans for 12 days and took 2.5 g chitosan per day on days 6, 7, 8, and 9.^[13] Feces were collected on days 2 through 12. Results showed that fat excretion in the feces did not differ significantly with chitosan consumption.

Take-home message. While products containing chitosan have been advertised as fat blockers, scientific evidence does not support this claim.

Chromium (*Chromium picolinate*)

Chromium is an element that has a role in carbohydrate and lipid metabolism. In a longitudinal, double-blind intervention study, 33 female patients were studied in 2 groups: 1 group took 50 g carbohydrates, 200 mcg chromium picolinate, 20 g soluble fiber, and 100 mg caffeine; the other (control) group took 50 g carbohydrates and placebo daily.^[14] The subjects' body weights did not differ significantly at the end of the study.

In a double-blind, randomized, controlled trial, 83 premenopausal women were supplemented with 200 mcg chromium picolinate, placebo, or picolinic acid for 12 weeks and were weighed each morning before breakfast.^[15] Body weight, composition, and iron status were measured and compared. The participants were fed controlled, nutritionally balanced diets. At the end of the trial, chromium supplementation did not result in a significant difference in body weight, composition, or iron status.

In the VITamins And Lifestyle (VITAL) cohort study of western Washington, questionnaires were given to participants covering 10-year supplement use, diet, health habits, height, and current and former weights.^[16] Multivitamins, vitamins B6 and B12, chromium, coenzyme Q10, dehydroepiandrosterone, essential fatty acids,

fiber, garlic (*Allium sativum*), ginkgo (*Ginkgo biloba*), ginseng (*Panax* spp), melatonin, soy, and St. John's wort (*Hypericum perforatum*) were examined. In the cohort who took long-term multivitamins, vitamins B6 and B12 and chromium were significantly associated with lower levels of weight gain over 10 years.

PhenCal, a proprietary blend containing chromium picolinate and several amino acids, was studied prospectively in 247 subjects over 2 years.^[17] Patients who took *PhenCal* showed a twofold decrease in percent overweight, a 63% to 70% decrease in food cravings, 41% to 66% decrease in binge eating, and a 14.7% regain of body weight compared with 41.7% in the control group. This study was replicated and extended for an additional 90 days^[18]; however, the study design had methodological flaws. Subsequently, in October 2000, the manufacturer of *PhenCal* agreed to settle charges by the US Federal Trade Commission that it made unsubstantiated efficacy and safety claims in its advertisements, which stated that the product was proven to cause weight loss and to prevent the regain of lost weight. Under the terms of that agreement, the manufacturer must possess competent and reliable scientific evidence when it makes any weight loss, safety, disease benefit, or comparative claim in the promotion of its products or programs.

A more recent, comprehensive review article of chromium concluded that the supplement does not alter body composition.^[19] Additionally, toxicity was reported in the case of a 33-year-old white female who presented with weight loss, anemia, hemolysis, thrombocytopenia, liver dysfunction (liver enzymes 15-20 times normal, total bilirubin 3 times normal) and renal failure (serum creatinine 5.3, blood urea nitrogen 152).^[20] She had been taking 1200-2400 mcg chromium picolinate for 4 to 5 months for weight loss. Laboratory values returned to normal limits upon supportive care and discontinuation of the chromium.

In another case report of toxicity, a 35-year-old woman developed nausea, fatigue, pruritis, dark urine, pale stools, and jaundice after consuming 200 mcg chromium daily in combination with vegetable extracts over a 5-month period.^[21] A liver biopsy confirmed toxic hepatitis. Supportive treatment was given and liver function tests returned to normal in 3 months.

Take-home message. Chromium picolinate is a trace element that works as a cofactor for insulin secretion. While this supplement is often studied in combination with other nutrients, few studies support its use as a weight loss aid.

Conjugated Linoleic Acid, Fiber, Green Tea, Guar Gum

Conjugated Linoleic Acid

Commonly known as CLA, this supplement is a naturally occurring polyunsaturated fatty acid and is essential for the delivery of dietary fat and glucose into cells. In a year-long study, 122 patients with a BMI > 28 underwent an 8-week period of dietary restriction.^[22] Patients who lost > 8% of their initial body weight (N = 101) underwent a randomized, double-blind trial of CLA supplementation 3.4 g per day or placebo. After 1 year, there was no significant difference in weight loss or adverse events between the 2 groups.

In a 16-week double-blind, randomized, placebo-controlled trial, 54 patients consumed a very-low-calorie diet for 3 weeks and then started a 13-week intervention period in which they were randomized to low dose CLA (1.8 g per day), high-dose CLA (3.6 g per day), or placebo.^[23] There was no significant difference in adverse events or weight regain, but feelings of fullness were significantly increased in the treatment groups. There was no significant difference in energy intake at breakfast.

Take-home message. Evidence is lacking to support recommending CLA for weight loss. However, it may help attenuate weight gain in patients with dietary deficiency of CLA.

Fiber

Dietary fiber has long been thought to increase satiety, but there is little evidence to support this claim. Eleven healthy men and women with a usual fiber intake ≤ 15 g per day were studied in a single-blinded study of two 3-week treatment phases with a 4-week washout period between phases.^[24] In the first phase, subjects consumed methylcellulose, a non-fermentable fiber, and in the second phase, they consumed fermentable fiber (pectin, beta-glucan). There was no significant difference in energy intake, weight, or body fat when comparing phases or baseline values.

In a randomized, double-blind, placebo-controlled, parallel study, 52 patients were randomized to treatment for 6 months with an energy-restricted diet and 7 g fiber per day or placebo.^[25] Weight loss was significantly greater in the treatment group while hunger feelings were significantly reduced. There was no significant difference in blood pressure or adverse events.

In two other studies, fiber or placebo tablets were given along with dietary restrictions to moderately obese women for 2 and 3 months.^[26] Mean weight loss in both treatment groups was significantly greater than placebo. No significant difference in hunger feelings was reported in any group.

Take-home message. In general, the average Western diet is relatively low in fiber. While there may be good reasons to increase the amount of dietary fiber, weight loss alone is probably not one. Excessive fiber intake may result in loose stools, intestinal cramps, and bloating.

Green Tea (*Camellia sinensis*)

Green tea extract is made up of polyphenols (flavanols or catechins) that are thought to be responsible for its claimed benefit in weight loss. In a randomized, parallel, placebo-controlled study, the effects of green tea were studied in 104 overweight and moderately obese subjects.^[27] Patients consumed a very-low-energy diet for 4 weeks, followed by green tea 104 mg per day or placebo for 13 weeks. During the 4-week very-low-energy diet phase alone, subjects lost on average 7.4% of their initial body weight. However, body-weight regain was not significantly different between the green tea and placebo group in the subsequent 13-week phase. Habitual high caffeine consumption in the treatment group was associated with a higher weight regain than habitual low caffeine consumption in the treatment group.

In a randomized, placebo-controlled trial of 34 obese Chinese women with polycystic ovarian syndrome, patients were treated with green tea or placebo for 3 months.^[28] At the end of the study, researchers concluded that green tea supplementation did not significantly reduce body weight or alter glucose or lipid metabolism.

In a case report, a previously healthy 44-year-old white female was admitted after consuming 720 mg of green tea per day for 6 months; she had also increased her physical activity and had lost 20 pounds.^[29] Her bilirubin, liver enzymes, and International Normalized Ratio (INR) were increased, and her symptoms worsened until she consequently required liver transplantation.

Take-home message. Commercially available green tea products contain varying amounts of caffeine. Caffeine exhibits a mild diuretic effect, which some patients may perceive as weight loss, but which is only a transient loss of sodium and water.

Guar Gum (*Cyamopsis tetragonolobus*)

Guar gum is a soluble dietary fiber derived from the Indian cluster bean.^[30] In a 5-week prospective, randomized, double-blind study, researchers measured body weight, hunger/satiety ratings, glucose, insulin, cholecystokinin, and leptons in 25 obese but otherwise healthy females taking 20 g guar gum daily or placebo.^[31] Guar gum fiber produced heightened postprandial cholecystokinin response but did not alter other satiety hormones or increase satiety ratings

in fasting or postprandial state. Predominant adverse events that have been reported are gastrointestinal-related and include flatulence, diarrhea, and nausea.^[30]

Take-home message. While guar gum may be a suitable source of soluble dietary fiber, there is insufficient evidence to recommend guar gum as a weight loss aid.

Guarana, Hoodia, Hydroxycitric Acid, L-Carnitine, Natural Licorice

Guarana (*Paullinia cupana*)

Guarana is native to Brazil and Venezuela and contains caffeine, tannins, resins, lipids, saponin, starch, and coloring agents. Guarana has been studied mostly as an herbal blend of various natural products, including Ma Huang, which contains ephedra.

One such preparation containing yerbe maté (leaves of *Ilex paraguayensis*), guarana (seeds of *Paullinia cupana*), and damiana (leaves of *Turnera diffusa*) was used in a small pilot study.^[32] In this double-blind trial, gastric emptying and weight were measured following consumption of these capsules over 10 days and 45 days, and body weight maintenance was observed over 12 months.^[32] The treatment group experienced significant weight loss and gastric emptying after 45 days. Body weight reductions were 0.8 kg after active treatment, compared with 0.3 kg after placebo capsules over 10 days, and 5.1 kg after active treatment, compared with 0.3 kg after placebo over 45 days. Maintenance treatment over 12 months resulted in no further weight loss or regain.

A number of adverse events have been reported with guarana, including irritability, heart palpitations, anxiety, and other central nervous system events.^[30]

Take-home message. Few studies have examined the use of guarana extract alone for weight loss. In clinical trials it has often been combined with other ingredients such as ephedra. Additionally, this supplement probably should be avoided due to reports of adverse central nervous system effects.

Hoodia

Hoodia is a genus that comprises 13 species, including *Hoodia gordonii*, which is touted for having weight-loss properties. Hoodia is a flowering succulent derived from a South African bush and is described as cactiform, appearing similar to the unrelated cactus family. Its proposed mechanism of action is suppression of the appetite center in the hypothalamus. A potential benefit of hoodia is the absence of stimulant properties and resulting increased blood pressure and anxiety.

Unfortunately, the evidence supporting its use is very limited. In a 2004 animal study, injections of P57 (the supposed active anorectic ingredient of *Hoodia gordonii*) were given to rats and were shown to reduce subsequent 24-hour food intake by 40% to 60%.^[33]

In an unpublished, double-blind, randomized, placebo-controlled trial, Phytopharm, a British company developing hoodia weight-loss products, showed that hoodia decreased caloric intake by about 1000 calories per day.^[34] In another unpublished investigation, Goldfarb and colleagues conducted a study in 7 patients over a 28-day period. Participants ingested 1000 mg of hoodia capsules per day, ate a balanced breakfast, and took a multivitamin. Exercise and other eating habits remained unchanged. Patients lost a mean of 3.3% of their body weight, with a median weight loss of 10 pounds.^[35]

Take-home message. Hoodia is perhaps the most popular natural nonprescription weight loss aid currently marketed. Unfortunately, there is little evidence in the medical literature to support recommending this agent.

Hydroxycitric Acid (*Garcinia cambogia*)

Makers of hydroxycitric acid supplements describe it as an accelerator of fat burning. It is derived from the rind of *Garcinia cambogia*, a fruit native to India. In a 12-week randomized, double-blind, placebo-controlled trial, 135 patients were randomized to 1500 mg hydroxycitric acid per day or placebo.^[36] Both groups consumed a high-fiber, low-energy diet. Results showed that the patients taking hydroxycitric acid failed to achieve a significant weight loss when compared with placebo.

Hydroxycitric acid was also studied in a double-blind, placebo-controlled trial of 10 males.^[37] The subjects consumed either 3 g of the supplement per day or placebo for 3 days. Respiratory quotients, energy expenditures, and blood samples were not significantly different during rest or exercise.

In a 6-week randomized, placebo-controlled, single-blinded, cross-over trial, 12 males and 12 females consumed 300 mg hydroxycitric acid 3 times daily for 2 weeks.^[38] Measured outcomes were 24-hour energy intake, appetite profile, hedonics, mood, and possible change in dietary restraint. Hydroxycitric acid significantly reduced 24-hour energy intake and produced weight loss compared with placebo that did not achieve significance. In a review of side effects, few and mild gastrointestinal adverse events were reported.^[30]

Take-home message. Hydroxycitric acid appears to be safe, but proof of efficacy for weight loss in humans is lacking. More studies are needed prior to recommending this supplement to obese patients.

L-Carnitine

In an 8-week trial, 26 moderately overweight premenopausal women were randomly assigned to placebo or L-carnitine 2 g twice daily.^[39] All patients walked for 30 minutes 4 days a week. Outcomes measured were total body mass, fat mass, and resting lipid utilization. There was no significant difference in outcomes for the 2 groups at the end of the study. Five patients in the treatment group experienced nausea or diarrhea leading to dropout from the study.

Natural Licorice

Natural black licorice contains a substance known as glycyrrhizic acid, which has been shown to cause sodium retention and hypertension; however, evidence of benefit in weight loss is lacking.

In 1 study, 15 patients consuming 3.5 g of licorice per day were monitored for 2 months.^[40] Endpoints included body fat mass and extracellular water. BMI did not change, but extracellular water was significantly increased and body fat mass was decreased after licorice consumption. Because of the adverse effects on sodium and water balance and the risk of raising blood pressure, patients should be discouraged from consuming large amounts of natural licorice. It should not be recommended as a weight loss aid.

Usnic Acid, White Kidney Bean Extract, Willow Bark, Yohimbine

Usnic Acid

Usnic acid is sometimes found in proprietary blends or multi-ingredient weight loss supplements. However, there is no convincing scientific evidence that it is effective for weight loss, and there have been reports of toxicity.

Two cases of severe hepatotoxicity were reported in previously healthy 38-year-old patients consuming dietary supplements containing usnic acid within the previous 3 months. Fulminant liver failure requiring transplantation

developed in 1 patient; submassive hepatic necrosis that did not require transplantation developed in the other patient.^[41]

In another case report, fulminant liver failure requiring transplantation developed in a previously-healthy 28-year-old female after she ingested 500 mg usnic acid daily for a total of 18 days in the previous month.^[42]

Take-home message. Due to a lack of evidence of efficacy and to the potential for serious adverse reactions, usnic acid should not be recommended for weight loss.

White Kidney Bean Extract (*Phaseolus vulgaris*)

White kidney bean extract is advertised as a "carb blocker" that reduces the rate at which starch is converted to sugar in the digestive process, thus reducing caloric intake. In an 8-week, double-blind, placebo-controlled phase 2 trial of a supplement containing white kidney bean extract, 50 adults were treated with 1500 mg twice daily or placebo for 8 weeks.^[43] Only 27 patients completed the study. The treatment group lost an average of 3.79 pounds while the placebo group lost an average of 1.65 pounds. Triglycerides were decreased threefold in the treatment group compared with the placebo group. Statistical significance was not achieved for either weight loss or triglyceride changes.

In a randomized, double-blinded, placebo-controlled study in 60 overweight volunteers, patients were given *Phaseolus vulgaris* extract (445 mg daily) or placebo for 30 days before each carbohydrate-rich meal.^[44] Outcomes measured were weight, fat, non-fat, skin fold thickness, and waist/hip/thigh circumferences. Subjects in the treatment group had a significant reduction of body weight, BMI, fat mass, adipose tissue thickness, and waist/hip/thigh circumferences. In this study, mean BMI was reduced by 1.0 kg/m over placebo.

Take-home message. White kidney bean extract inhibits the activity of the digestive enzyme alpha amylase. This results in delaying or attenuating the absorption of starch and carbohydrates. At least 1 recent clinical trial has shown a modest, albeit statistically significant decrease in body mass index.

Willow Bark

Willow bark contains salicin, the ingredient that led to the introduction of aspirin. It has been used as an anti-inflammatory and antipyretic agent and was only recently hypothesized to be beneficial in weight loss.

Willow bark was ingested by a 25-year-old female with a history of an aspirin allergy in 1 case report.^[45] Within 75 minutes of ingestion, the woman developed shortness of breath and itching and was admitted to the hospital and treated with diphenhydramine, epinephrine, methylprednisolone, and fluids. Patients with asthma or aspirin allergy should be cautioned against using products containing willow bark.

Yohimbine (*Pausinystalia yohimbe*)

Yohimbine is an alpha-2 receptor antagonist derived from an evergreen tree native to Central Africa.^[30] In a randomized, double-blind, placebo controlled trial, 47 patients were assigned to yohimbine (peak dose, 43 mg/day) or placebo for 6 months.^[46] Only 33 participants completed the trial. Outcomes included changes in body weight, BMI, total cholesterol, high-density lipoprotein, body fat, and fat distribution. At the end of the trial, there were no significant differences in any outcome measured.

In another randomized, double-blind study, 20 female patients consumed a 3-week low calorie diet and then received placebo or 5 mg yohimbine 4 times a day for 3 weeks.^[47] Yohimbine significantly increased weight loss

compared with placebo. However, adverse events documented in trials include hypertension, anxiety, and agitation.^[30]

Counseling Patients

When counseling patients, healthcare providers should keep in mind the paucity of evidence on the efficacy or safety of commonly available weight loss agents. Before recommending such products, clinicians should inform patients of potential risks as well as questionable benefits. Lifestyle modifications, such as caloric restriction and exercise, should always be the first-line treatment for obesity. However, clinicians should recognize the popularity of products currently on the market and the likelihood that their patients may be using them (Table).

Table. Currently Available Weight Loss Products

Name	Ingredients	Instructions	Price
<i>DEX-L10</i> South African Hoodia Gordonii (by DelMar Labs)	DEX-L10 Hoodia gordonii stem 500 mg	1 capsule 1 hour before lunch and dinner, maximum of 6 capsules per day	39.99 for 120 capsules
Irwin Naturals Green Tea Diet (by Applied Nutrition)	Chromium picolinate 250 mcg, green tea extract (leaf) 100 mg, natural caffeine (coffee bean) 80 mg, xenedrol blend 23 mcg (<i>Advantra-Z</i> , citrus aurantium extract (fruit), betaine, bladderwack root and leaf, cayenne (fruit), eleuthero root (formerly known as siberian ginseng), ginger root, gotu kola root, guarana seed, licorice root, yerba mate leaf)	1 or 2 capsules in the morning and 1 or 2 in the afternoon	6.59 for 30 capsules
Natrol <i>Tonalin CLA</i> Softgels (by Natrol Inc.)	Tonalin proprietary blend 1.2 g (conjugated linoleic acid, oleic acid, palmitic acid, stearic acid, linoleic acid)	1 softgel with each meal	15.39 for 90 softgels
Irwin Naturals Liquid-Gel Carb Blocker (by Applied Nutrition)	White kidney bean extract (<i>Phaseolus vulgaris</i> bean extract) 1000 mg, <i>IsoPhase 2200</i> 600 mg, soybean oil, conjugated linoleic acid, white tea extract, bioperine (black pepper extract)	1-2 capsules with starchy carbohydrates	6.59 for 30 capsules
Klein-Becker USA <i>Anorex-SF</i> (<i>Leptoprin-SF</i>) Weight Control Caps for the Significantly Overweight	Calcium 132 mg, <i>Anorex-SF</i> 1493.5 mg (calcium phosphate, <i>Commiphora mukul</i> extract, <i>Garcinia cambogia</i> (HCA 125 mg), l-tyrosine, acetylsalicylic acid - 162.5 mg, dipotassium phosphate, sodium phosphate, disodium phosphate, phosphatidyl choline, scutellaria (root), bupleurum (root), epimedium (herb)	2 capsules 3 times a day	49.89 for 180 capsules
Mega Grapefruit Dietary Supplement (by CCA Industries Inc.)	Grapefruit extract 75 mg, glucomannan for Konjac root 600 mg, gymnema sylvestre leaf standardized extract 50 mg	1-2 capsules twice a day	5.69 for 30 capsules
<i>Stacker 3 XPLC Extreme Performance Formula</i> (by NVE	Proprietary blend (pausinytalia yohimbe alkaloids) 195 mg, 6',7'-dihydroxybergamottin, yerba mate, camellia sinensis 60% polyphenols, capsaicin,	1 capsule after meals	31.99 for 60 capsules

Pharmaceuticals)	caffeine 200 mg		
<i>TrimSpa Original Formula X32</i>	Glucomannan 200 mg, citrus naringin 5 mg, glucosamine 5 mg, cocoa extract 162.5 g, green tea extract 125 mg, hoodia gordonii 125 mg	2 capsules in the morning, 1 at midday, 1 in the evening	38.99 for 105 capsules
<i>Carb Cutter Phase 2 Starch Neutralizer</i> (by Health & Nutrition Systems Inc.)	Phase 2 starch neutralizer (phaseolus vulgaris from white kidney bean extract) 500 mg, proprietary carb free blend 50 mg (gymnema sylvestre leaf, fenugreek seed, garcinia cambogia, hydroxycitric acid, vanadium)	1-2 tablets with each of 2 largest carbohydrate meals of the day	23.69 for 60 tablets
<i>Ultra Diet Pep Tablets</i> (by Natural Balance)	Vitamin B6 10 mg, vitamin B12 5 mcg, pantothenic acid 25 mg, iodine 50 mcg, chromium 120 mg, potassium 50 mg, proprietary blend 750 mg (green tea extract, L-tyrosine, kelp, dandelion leaf, ginger root, passion flower extract)	1 tablet midmorning, 1 tablet midafternoon	27.99 for 120 tablets
<i>Dexatrim Dexatrim Natural Extra Energy Formula, Caplets</i> (by Chattem Inc.)	Calcium 25 mg, chromium 250 mcg, green tea leaf standardized extract 622.5 mg, Asian ginseng root 100 mg	1 caplet 3 times a day shortly before each meal	6.99 for 30 caplets
Nature's Bounty Apple Cider Vinegar Diet	Vitamin B6 25 mg, chromium 200 mcg, apple cider vinegar 900 mg, apple pectin 150 mg, gymnema sylvestre leaf 600 mg	3 tablets daily, preferably 1 after each meal	10.49 for 90 tablets
NuNaturals Pure Liquid Cinnamon Extract	Cinnamon extract 100 mg	1-2 droppers with meals	9.49 for 2 oz
<i>Stacker 3 Ephedra Free Formula with Chitosan</i> (by NVE Pharmaceuticals)	Proprietary blend 225 mg (kola nut, cactus extract, white willow bark, grapefruit extract, chitosan), caffeine 250 mg, tri-guarcinia 3 complex 25 mg (green tea, guaran, garcinia)	1 capsule after meals	29.99 for 100 capsules
<i>Zantrex-3 3, Ephedrine Free Dietary Supplement</i> (by Zoller Laboratories)	Niacin 30 mg, Zantrex-3 proprietary blend 1312 g (yerba mate, caffeine, guarana, damiana, green tea, kola nut, schizonepeta, piper nigrum, Tibetan ginseng, panax ginseng, maca root, cocoa nut, thea sinensis complex)	2 capsules 15-30 minutes before main meals and 2 capsules anytime as needed for an energy boost, maximum of 6 capsules per day	38.99 for 112 capsules

Source: <http://www.drugstore.com>