
INNOVATIONS | NUTRITION UPDATES AND APPLICATIONS

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Think What's Possible: Proven Approaches and New Technologies for Weight Management

Diet Drugs Rise and Fall

For a while in the mid 1990s it looked like Americans had obesity under control thanks to the discovery that the combination of two common diet drugs, fenfluramine and phentermine, produced weight loss results unattainable when either was used alone.¹ As news of this discovery spread, hundreds of thousands of people flocked to their physicians for diet drug prescriptions. Many doctors whose medical specialties did not typically include obesity treatment, jumped on the "script" writing bandwagon. Numerous pharmaceutical firms raced to develop a single drug to replace the popular fen-phen combination. Wyeth-Ayerst succeeded and introduced Redux™. Both the fen-phen combo and Redux (dexfenfluramine) depress appetite (the psychological desire for food) by stimulating production of the "feel good" neurochemical serotonin.² As with other easy weight loss schemes, the diet drug revolution soon floundered. On September 16, 1997, after receiving numerous reports of heart valve damage, and even death in patients taking the fen-phen combo, the FDA withdrew fenfluramine (Podimin™) and Redux™ (dexfenfluramine) from the market. Overnight a huge pool of patients

found themselves without the drugs they had come to depend on, and without the skills necessary to manage their weight on their own. Some turned to Xenical™,³ a diet drug that blocks about one-third of the fat in a meal from being absorbed by the small intestine. Xenical™, also known by its generic name of Orlistat, does not

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Welcome to the **INNOVATIONS: NUTRITION UPDATES AND APPLICATIONS** newsletter brought to you by the joint partnership of Novartis Nutrition OPTIFAST® and McGraw-Hill. We hope this collection of nutrition information and reports is helpful to you as you learn more about the science of nutrition. It is our goal to produce a useful, practical resource that will keep you abreast of the latest developments in nutritional science and to provide insights into the challenges that we face in maintaining healthy lifestyles in the new millennium. Each issue will focus on a specific topic of interest. If you would like to order additional copies of this newsletter for your students, please contact your local McGraw-Hill sales representative. We welcome your feedback and suggestions for future issues of the INNOVATIONS newsletter. You can provide your feedback by writing us at Nutrition, McGraw-Hill, 2460 Kerper Blvd., Dubuque, IA 52001 or at our web site: <http://www.mhhe.com/hper/nutrition/>



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enter the bloodstream so many people viewed it as a safe alternative to other diet aids. Often described as “Antibuse for dieters,” it can have unpleasant side effects. If you eat too much fat (more than 30 percent of your calories) while taking it, steatorrhea (fatty diarrhea) and gastric pain result. Many diet drug users became too fearful of side effects to consider any weight loss drug therapy. Others eventually tried Meridia™.⁴ Marketed about six months after the fenfluramine withdrawal, it also elevates the brain serotonin level, but by using a different mechanism. It inhibits serotonin uptake by brain tissue. Weight loss in people using these drugs is modest, 10 percent to 15 percent of body weight. They are weight management aids, but not cure-alls.

Presently, the future of Meridia is in question. In the spring of 2002 consumer protection groups began urging the FDA to withdraw Meridia from the market due to documented deaths in the United States and abroad from people using this drug. Many European countries have already pulled Meridia from the market.⁵

Despite the potential pitfalls, over 100 pharmaceutical agents are currently being studied as weight loss drugs. The perfect diet drug would work effectively to produce a medically, as well as cosmetically, significant weight loss and cause few if any side effects. With over 50 percent of the population currently overweight, creation of such a drug has enormous profit potential.⁶

Not everyone believes drugs are the magic bullet of weight control. During the height of the fen-phen craze, many health care experts cautioned that all drugs, even the most benign, have side effects. Furthermore, they were concerned that the serotonin-altering drugs tended to lose their effectiveness over time. Initially, people using fen-phen or Redux would experience a significant decrease in appetite and, hence, lose

What Do Obesity Experts Think of Diet Drug Therapy?

“Obesity drugs should be considered one of the potential tools that can be used to treat obesity, but the cornerstone of therapy remains lifestyle changes.”

Dr. Samuel Klein, director of the Center for Human Nutrition at Washington University School of Medicine in St. Louis, and incoming president of NASSO (National Association for the Study of Obesity) May 2002

Dr. Louis Aronne, director of the weight programs at Weill-Cornell Medical Center in New York, says doctors might one day be treating people who have ten to twenty pounds to lose in hopes of keeping them from becoming obese. Attacking obesity before it gets out of hand may reduce the need for medications that treat the weight-related complications such as diabetes, high blood pressure, high cholesterol, and other illnesses.

Thomas Wadden, director of the Weight and Eating Disorders Program at the University of Pennsylvania School of Medicine, says medications have an important place, but they will end up being most beneficial to people who have a genetic propensity to being overweight, Wadden says, “They are a minority of the people who are overweight or obese. Most people are now overweight as a direct consequence of our lifestyle. For them, the best advice is to start walking and start eating more fruits and vegetables.”

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weight. In the majority of patients, however, this effect would lessen 6 to 12 months into treatment and because they had relied on drug therapy rather than developing a new lifestyle conducive to weight management, they would begin to gain weight again.⁷

Fortunately, while drugs were making a big splash in clinical treatment of obesity, researchers were making advances in understanding of obesity. Long-held beliefs such as “95 percent of dieters fail,” and “dieting permanently lowers a person’s metabolic rate making him/her more susceptible to regaining weight,” were refuted⁸ and some new ideas gleaned from successful dieters participating in the National Weight Control Registry surfaced.⁹ Simultaneously, advances in computer chip technology and fiber optics led to some innovative weight management tools.

Following the withdrawal of the fenfluromines from the market, many felt we were back to square one, in terms of treating obesity. Not everyone saw this as bad news. Speaking at the American Dietetic Association national meeting in October 1999, Susan Drawert, MEd, RD director Novartis OPTIFAST® department stated, “While new therapies, such as drug treatment, continue to emerge, it is still diet, exercise, and lifestyle change therapy that remain the cornerstones for effective obesity treatment. Medically monitored weight management programs provide all of these essential components.” OPTIFAST, one of the oldest medically monitored weight loss programs, is now entering its 29th year. It is widely used to treat significantly overweight individuals in many major medical centers around the United States and in Canada. Notably, OPTIFAST continued to rely on the basics of diet and exercise, backed up by lifestyle change therapy—including such elements as being assertive, managing stress, and managing environmental cues that cause us to be sedentary and eat, while at the same time incorporating promising new techniques such as digital self-monitoring devices.

Technology Monitors Weight Management

The explosive growth of the Internet in the mid to late 1990s caused millions of average Americans to jump online to find information about their favorite hobbies and pastimes. It was not long before dieting—a national obsession—made its way onto the Net.

One of the first and best dieting sites was Calorie King (www.calorieking.com). Produced by Allan Borushek, biochemist, dietitian, and editor and publisher of the popular trade book, *The Doctor's Pocket Calorie, Fat & Carbohydrate Counter*, the site started as an interactive version of the trade book. It has evolved into a popular and free online Diet Diary.

The current site provides members with the following services free of charge:

- Personalized meal plans
- Electronic food and exercise diary that tracks calories eaten as well as calories burned
- Progress charts
- Weekly tutorials
- Daily menu planner and shopping list
- Searchable food database
- Online support, including discussion boards and chat rooms.

In addition to the calorieking.com website, the company produces a browsable food database and electronic diary for Palm OS (\$14.95 to \$29.95 depending on the edition), and an online newsletter that provides reviews of new weight loss products, food, and health news.

Other sites provide weight management support for a fee. Two popular fee-for-service sites are cyberdiet.com and eDiets.com. Cyberdiet, established by two dietitians, was basically a free dieter’s resource when it went online in the late 1990s. It won praise from the American Dietetic Association for its balanced information, useful weight management tools (including a Body

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Mass Index calculator and a waist-to-hip ratio calculator), ethnic cuisine calorie calculator, and special features like chats rooms, success stories, question and answer sessions with recognized health experts, and seasonal menus. In January of 2002, Cyberdiet established a membership fee. Visitors must pay for its many useful tools. However, it added a biweekly newsletter that provides excellent weight loss tips and educational topics.

eDiets, on the other hand, started as a commercial venture. It claims to have 5.6 million members, and promises to provide personal 24/7 support, customized meal plans, recipes and shopping lists, online meetings, chat rooms, message boards, and sixty-five support groups. Subscribers can specify vegetarian or traditional meal plans and have their choice of a convenience diet which is built around prepackaged entrees with added fruits and vegetables, a fix-it-yourself plan, or a combination plan. The service costs \$99 a year and there are tempting extras to purchase, like motivational tapes. A \$5.00 fee will buy you a one-week preview of the service.

If you are always on the go, you may prefer to carry your weight loss program with you. Healthetech™ corporation has developed a suite of high tech monitoring tools that fit in the palm of your hand, many in the form of software for a Personal Desk Assistant (PDA) such as a Palm Pilot or Visor. Windows-compatible software is also available. BalanceLog™ software is a

Is e.dieting Successful?

No one knows for sure. Online counseling and support has been shown to improve patients' ability to control diabetes and asthma. It is important to recognize however, that the often-quoted figure that "e.counseling can improve weight loss results by 33 percent to 50 percent" comes from a single study with fewer than eighteen participants. At the end of twelve weeks those individuals who received e.counseling and a daily encouraging email message lost an average of nine pounds. Those dieters who did it on their own lost an average of six pounds. In terms of the actual number of pounds lost, these results are hardly spectacular.

There are other risks to consider besides poor weight loss results. Online dieters who have an undiagnosed weight-driven disease such as Type 2 diabetes may put their health at risk by using a do-it-yourself weight-loss approach rather than seeking qualified help. Health care practitioners who provide online support are deprived of another valuable tool—getting to meet their patients face to face and seeing how they react to certain questions and situations. One study found that without in-person meetings, experienced therapists often were unable to identify serious personality defects during online chats.

One of the best uses for online weight loss counseling may be as a means of added support between visits with a qualified weight loss coach, or in addition to a medical weight loss program.

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Cadillac version of the Palm OS software available from Calorie King. BalanceLog tracks food intake and activity level then converts it into calories, nutrients, and exercise and compares this data with your preselected nutrition and weight management plan. Data is presented in easy-to-interpret pie charts and bar graphs. You can select from a daily, weekly, or monthly view of your calorie balance. Prices range from start at \$49 for the basic Palm software to \$69 for a Windows and Palm OS software package.

Users report that they like the novelty of entering foods in a PDA and they really appreciate the instant calorie and nutrient intake feedback, as opposed to having to write entries in a diet diary then hand calculate or tabulate the same information.

A slight variation on the BalanceLog software's nutrition tracking capabilities produced GlucoPilot™. It is a diabetes management software package for PDAs equipped with PALM OS software. GlucoPilot is intended to increase the control individuals with diabetes have over their disease by allowing them to track blood sugars, insulin, and carbohydrate intake. GlucoPilot allows them to categorize their blood sugar records and compile reports, charts, and graphs. At \$29 this useful tracking application has the potential to revolutionize the way diabetics and their healthcare practitioners manage this dangerous disease. Since many obese individuals develop diabetes it may be a useful addition to the BalanceLog software.

One of the most unique tools made by HealthTech is the BodyGem™, a compact handheld device that is able to accurately determine Resting Metabolism Rate (the number of calories burned per day at rest) from the oxygen content of a breath sample. The idea behind this tool is that many overweight people wrongly assume they have a slow metabolism. If they could easily learn the truth they may be more motivated to change their lifestyle habits in order to control their weight. Furthermore, using the BodyGem pre, during, and post dieting will

help dieters see how cutting calories slows their metabolism but regular exercise, especially weight lifting exercise, builds calorie-burning muscle tissue. With a price tag around \$1000 for the BodyGem unit itself, and \$10 a piece for each disposal, nonreusable breathing cone, this is not destined to become part of the average dieter's tool kit any time soon. However, weight loss clinics and health clubs are buying them and offering RMR tests for a fee. If you are interested in finding a site near you that performs this test visit the Healthetech.com website. The most significant application of this technology is likely to be in clinical settings where dietitians and other health care practitioners can use the professional version of the BodyGem known as MedGem™ to track RMR of patients suffering from a variety of conditions including obstructive lung diseases, diabetes, cancer, and traumatic injuries. Until now, health care workers have relied on an equation to estimate calorie needs. Now basic calorie needs can be measured accurately and dietary interventions adjusted accordingly.

Pedometers Step Toward Good Health

Advances in chip and digital technologies have resulted in a new breed of smaller, more accurate, and more sophisticated pedometers. The Y-Max pedometer, selected by Health Partners, the Minnesota-based health management organization that developed the successful 10,000 Steps A Day Program, embodies the features of the new pedometers. Its easy-to-read digital display tracks steps, miles, and calories. Its sensitivity can be adjusted to match your stride length, and being smaller than an Aspirin tin, it clips discreetly to a belt or waistband.

In addition to being a good self-monitoring device, pedometers have proved to be a great motivational tool. The average American couch potato takes only 2300–3000 steps a day. By increasing activity to 10,000 steps a day, people can burn an extra 150 calories. Once people start wearing a pedometer they are more likely to

Pedometers have proved to be a great motivational tool.

"Wearing a pedometer broke my cycle of denial. I started taking the stairs instead of the elevator, and walking instead of driving to as many errands as possible." Sandy

become aware of just how little they are moving and since they can get immediate feedback they often make an effort to be more active. Many people have said it that broke their denial about their activity levels.

Obesity Surgery (re)Surges in Popularity

Bariatric surgery is regaining popularity as a weight management technique for very obese individuals (those with 100 pounds or more of excess body weight). Two factors account for this, 1) the number of obese Americans has risen 61 percent in the last decade, and 2) surgical advances have improved the outcomes. Thanks to advances in fiberoptic technology, surgeons can perform many operations that once required large, hard-to-heal incisions by inserting a tiny camera and operating instruments through a series of one- to two-inch openings in the abdomen. Though there are still risks associated with this procedure, it is much safer than the original stomach shrinking and gastric bypass techniques using a standard open abdominal surgery technique. Open abdominal bariatric surgery is still used in super obese individuals (those with over 100 pounds of excess body weight). Doctors estimate the success rate is about 90 percent. However, about 1 percent of patients will die from complications. Health experts believe this risk is acceptable in cases where every other treatment has failed because the morbidly obese already have a very high likelihood of early death from health problems such as diabetes, high blood pressure, high cholesterol, and sleep apnea.

Bariatric surgery has been covered extensively in the media over the past year. Much of the emphasis has been positive, focusing on how it helps people regain control of their lives. Morbidly obese people are often too large to fit in seats in theaters, amusement rides, and airplanes. Simply walking around can be exhausting when you are carrying 100 extra pounds or more. However, it may give people a false image of the tremendous lifestyle changes that occur when you shrink your stomach to the size of a walnut or small egg. Most individuals can only tolerate 2 ounces of food or fluid at a time, must eat many tiny meals throughout the day and sip water very frequently to prevent dehydration. Some foods—particularly high protein foods, very fatty foods, and very sugary foods—can cause gastric pain even when eaten in small quantities.^{10,11}

The central issue remains: If overweight and obesity are really environmental conditions why are we spending so much time and effort as a society treating the symptom (excess weight) and not treating the causes? As we have seen, some new technologies, such as the interactive websites and software that tracks activity and calorie intake, can help people monitor the environmental conditions that lead to weight gain. Widespread environmental changes such as taxing fast food, eliminating soft drinks from schools, and so on have been proposed. Will the public accept them? Will powerful food companies tolerate these restrictions? The next issue of *Innovations* will explore the scientific and social approaches to shaping a healthier environment.

Bariatric Surgery Fast Facts

- 75,000 people will have bariatric surgery this year
- 13–16 million Americans are morbidly obese (100 pounds or more of excess body weight or a BMI \geq 40) and thus meet the basic qualification for bariatric surgery
- Obese individuals who don't meet the criterion for morbid obesity but who have two or more weight-related diseases and have been unsuccessful dieters also may qualify.
- The typical procedure costs \$14–\$35,000
- Insurance coverage is often inadequate
- Insurance does not pay for plastic surgery to remove folds of overstretched skin that develop after a massive weight loss

ACTIVITIES

The following activities were designed to help you explore the new online weight management tools.

I. Using the food intake and activity diary you collected for your diet analysis project, compare the diet analysis information available from a computerized diet analysis program like FoodWise with that available from online diet analysis programs such as CalorieKing.com or e.diets.

- A. Which approach gives the more complete picture of your diet and activity pattern? Explain.
- B. Was the data for total calories, calories from fat, and calories burned during exercise obtained by each method similar (e.g. the results obtained by each method were within 5% of each other)? Slightly different (results varied between 5% and 10%) or very different (results varied by 15% or more).
- C. What do you think may account for the observed variation?
- D. What diet analysis approach do you think would be most beneficial for the typical consumer? Explain.

II. Visit the HealtheTech.com web site. Surf to the http://www.healthetech.com/corp/consumer/balancelog_screenshots.jsp screen to view the data screens available for Balance Log weight management software.

- A. If you owned a PDA (e.g. Palm Pilot), do you think you would make use of it to record your food and activity habits? Why or why not?
- B. Do you think that having data about your food and activity patterns presented in the formats shown on the Balance log screen would improve your weight management and health habits? Why or why not?
- C. Did you find the information presented on the data screens easy to interpret?

III. Many virtual as well as brick and mortar healthcare systems are trying to improve the health of their subscribers by emailing them weekly wellness tips and /or health newsletters. Sign up for one of the free services such as a trial subscription to e.diets or a standard subscription to Johns Hopkins Intellihealth Nutrition and Fitness newsletter (<http://www.intelihealth.com/IH/ih/IH/EMIHC000/24479/7046.html?k=mailx408x7046>)

- A. How useful or motivating do you find email newsletters and tips?
- B. Do you routinely open these emails, or do you tend to skip over them?
- C. If you do open them, do you try to follow the advice?

IV. Visit the calorie control council web site www.caloriecontrol.org. Click on the Low-calorie Sweeteners link and read the information provided for some of the less common sweeteners such as Trehalose and Neotame. Also read the Benefits of Use and Health Professionals Opinion sections.

- A. Do you think this information is useful to consumers? If so, how would you use it?
- B. This web site is sponsored by the Calorie Control Council, a group of food manufacturers who make various low-fat, low-calorie food ingredients and products. Given this background information, how biased do you think the material presented on this site is? Do you think the Health Professionals Opinion section contained adequate information as to the possible risks of using these products?
- C. In your opinion, how could this site be improved?

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