Advancements in Medical Weight Loss: Diets and Drugs

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Disclosures

Objectives

1. Understanding the scope and costs of the obesity problem
2. Latest research on proven weight loss methods
3. How to implement a successful weight loss program
4. Prescription Medications for weight loss
5. Using apps and technology for weight loss
6. Final takeaways and conclusions
7. Questions and answers

Secret to Weight Loss

Weight Loss
vs
Fat Loss

Weight Management

- Has anyone successfully lost weight?
- How did you do it?
- Kept it off?
- Why?
- In your practice, how many patients do you see for just weight management?


KENNON
TITAN

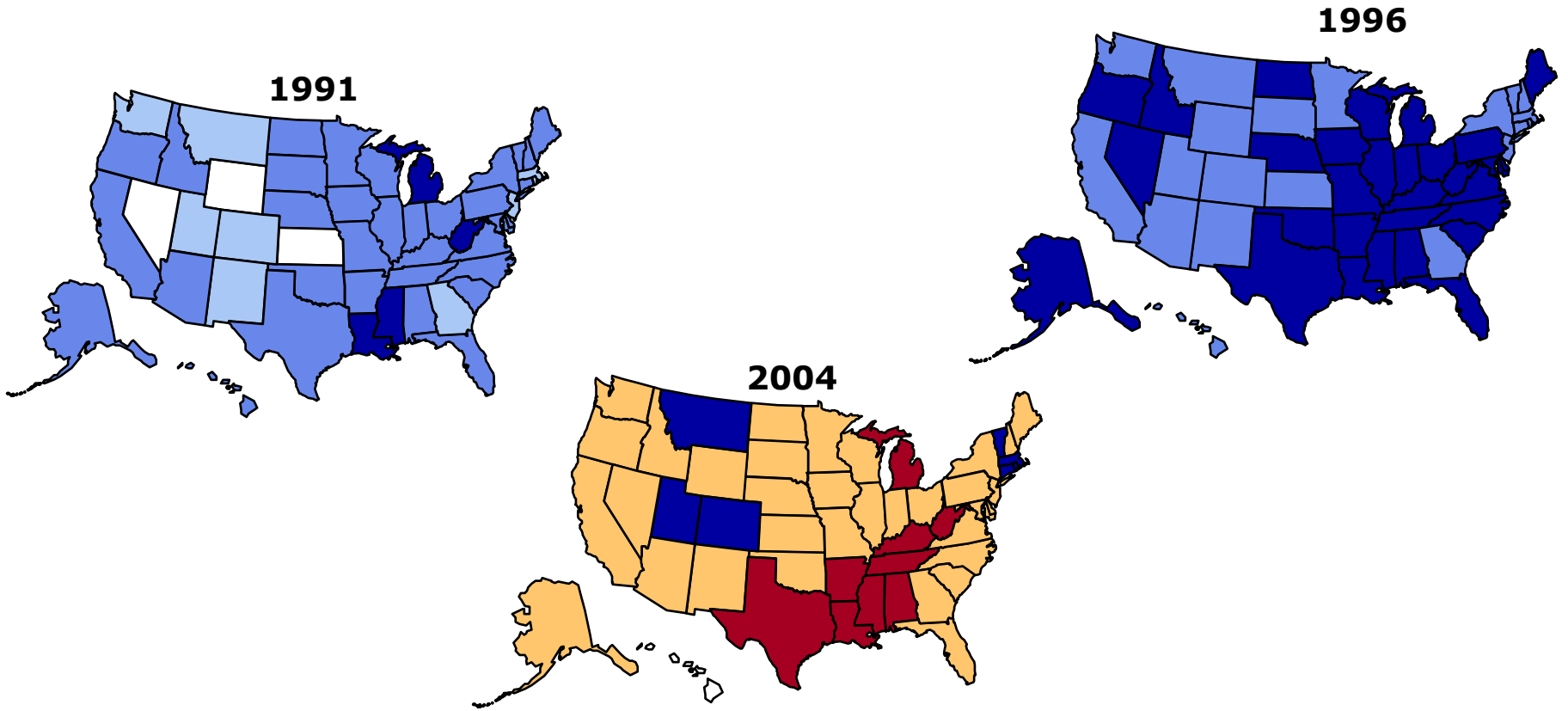
Scope

- 79% of adults overweight or obese
- 22% of adults obese
- 16.6% of children 2-19 years of age are overweight (5.6% Obese)
- 12% of children 2-5 years of age are overweight

Obesity Trends* Among U.S. Adults

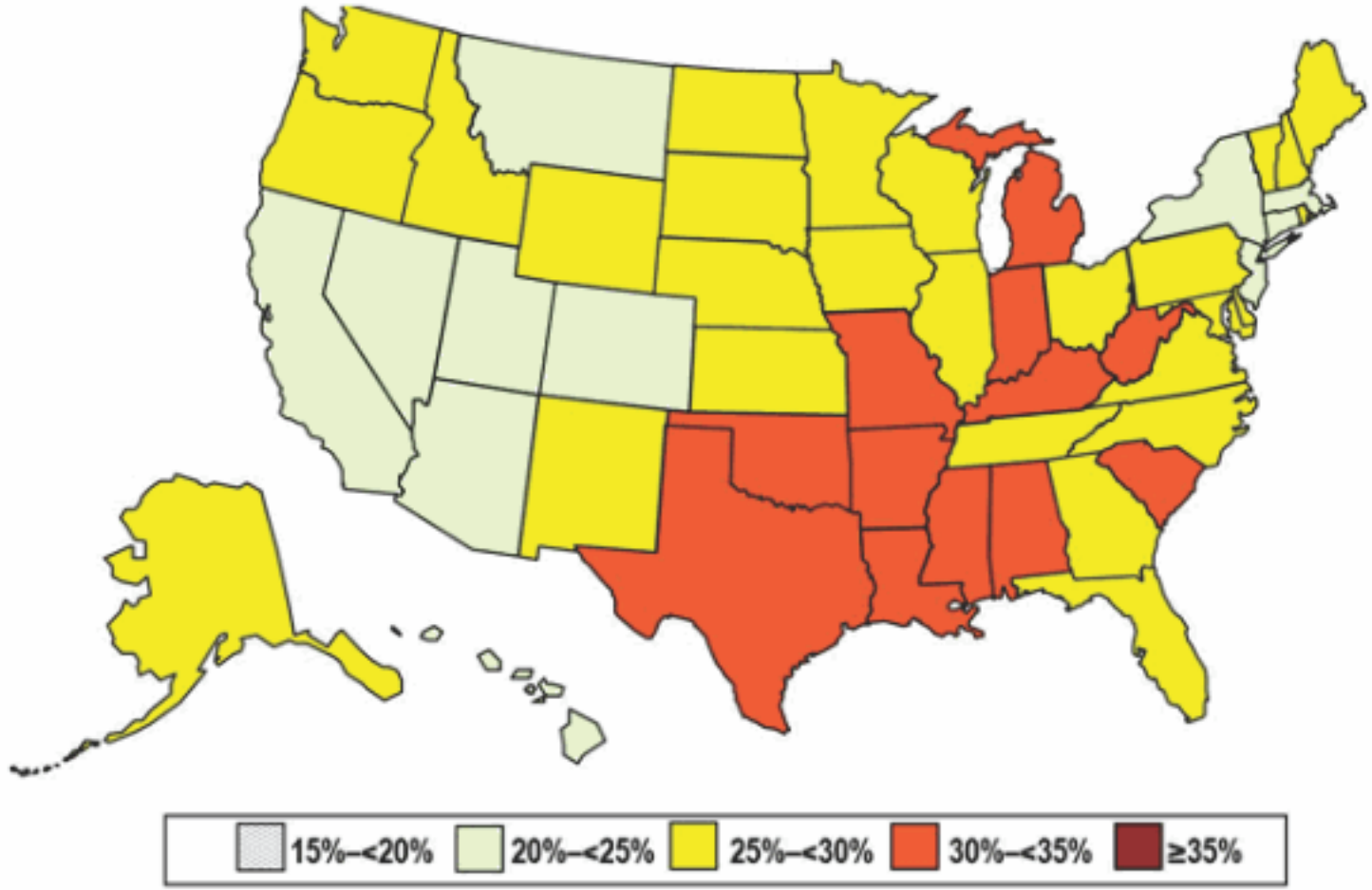
BRFSS, 1991, 1996, 2004

(*BMI ≥30, or about 30 lbs overweight for 5'4" person)



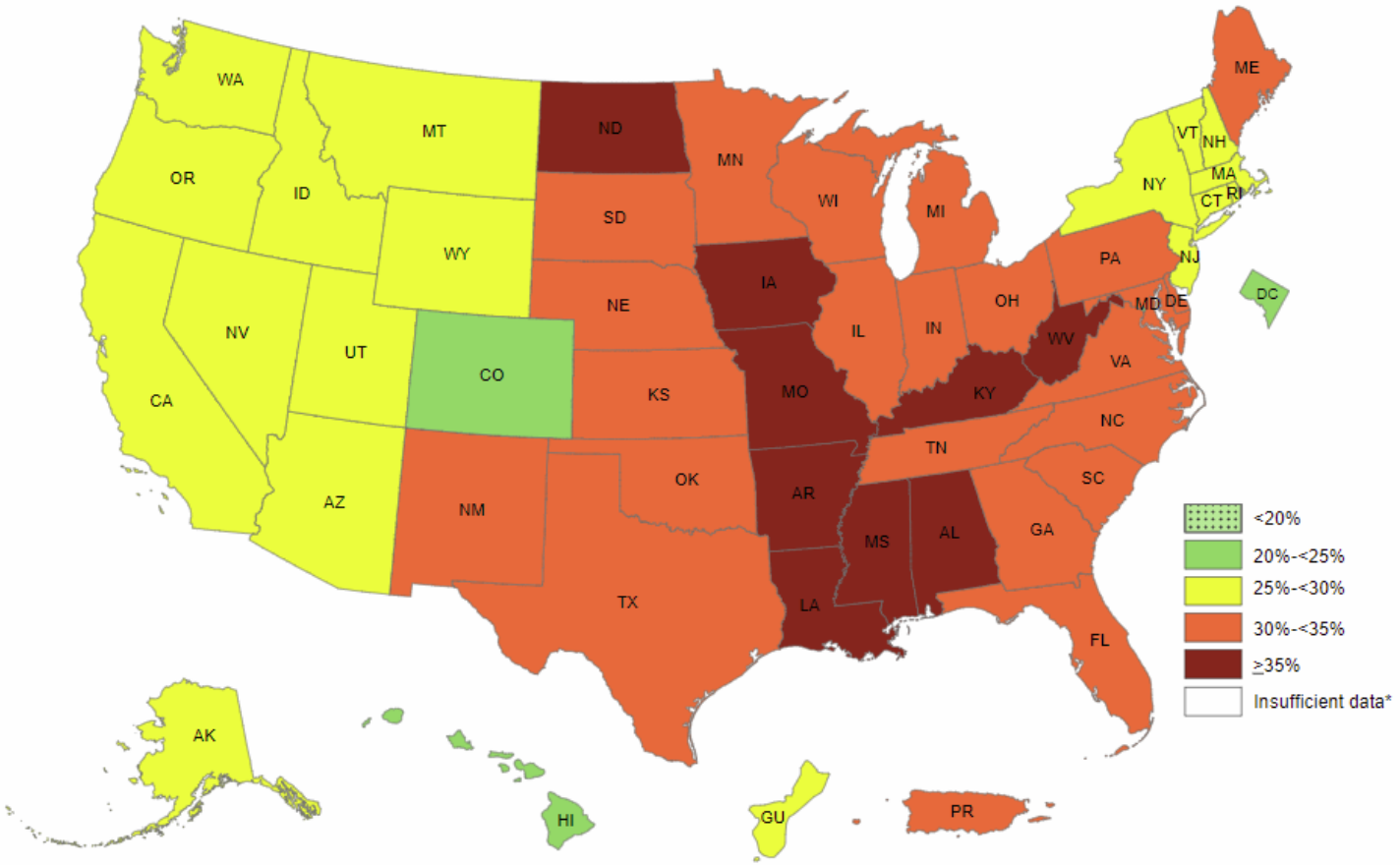
Prevalence of Self-Reported Obesity Among U.S. Adults

BRFSS, 2011



Prevalence† of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2018

†Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



Prevalence of Self-Reported Obesity Among Non-Hispanic Black Adults by State and Territory, BRFSS, 2016-2018

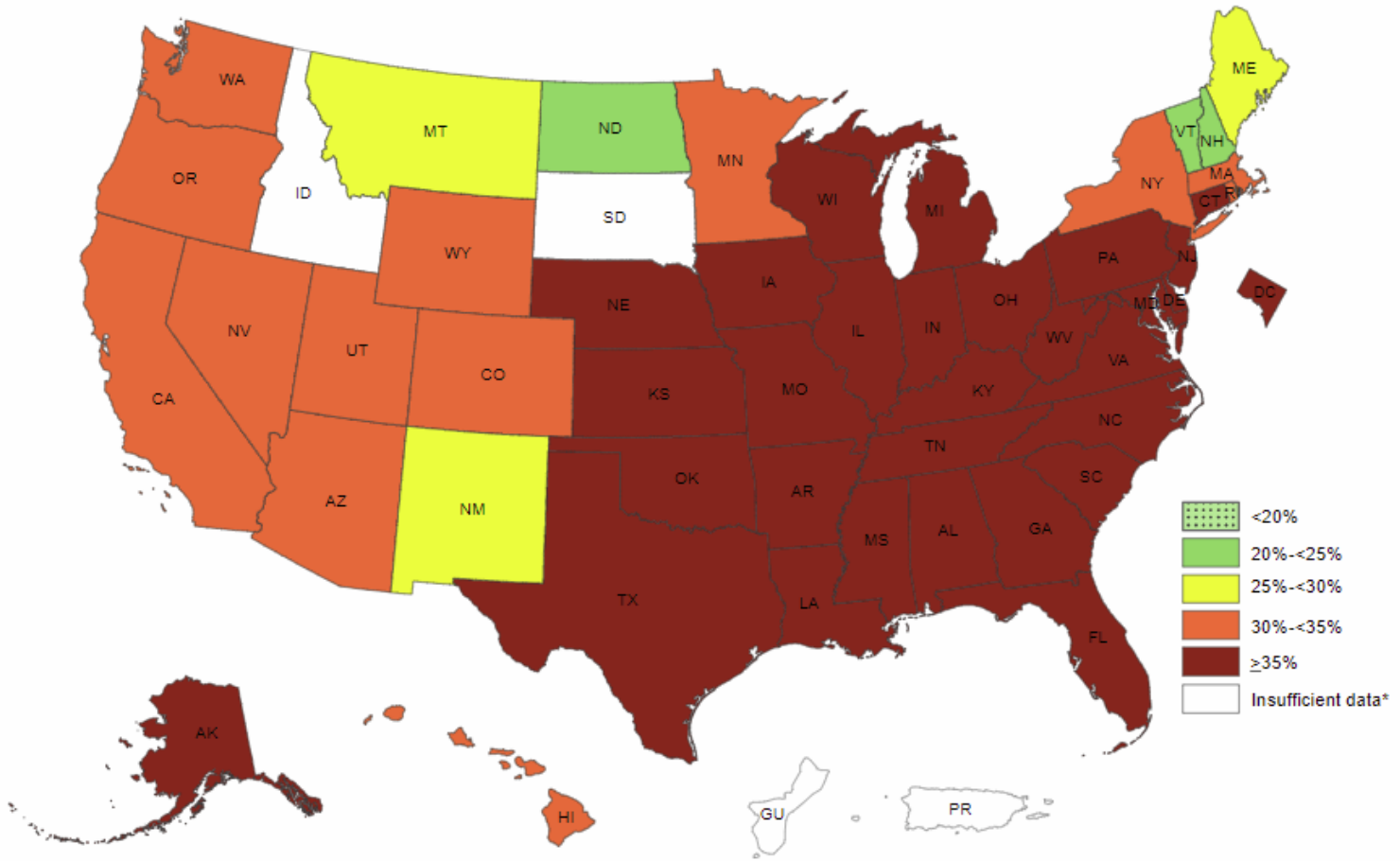
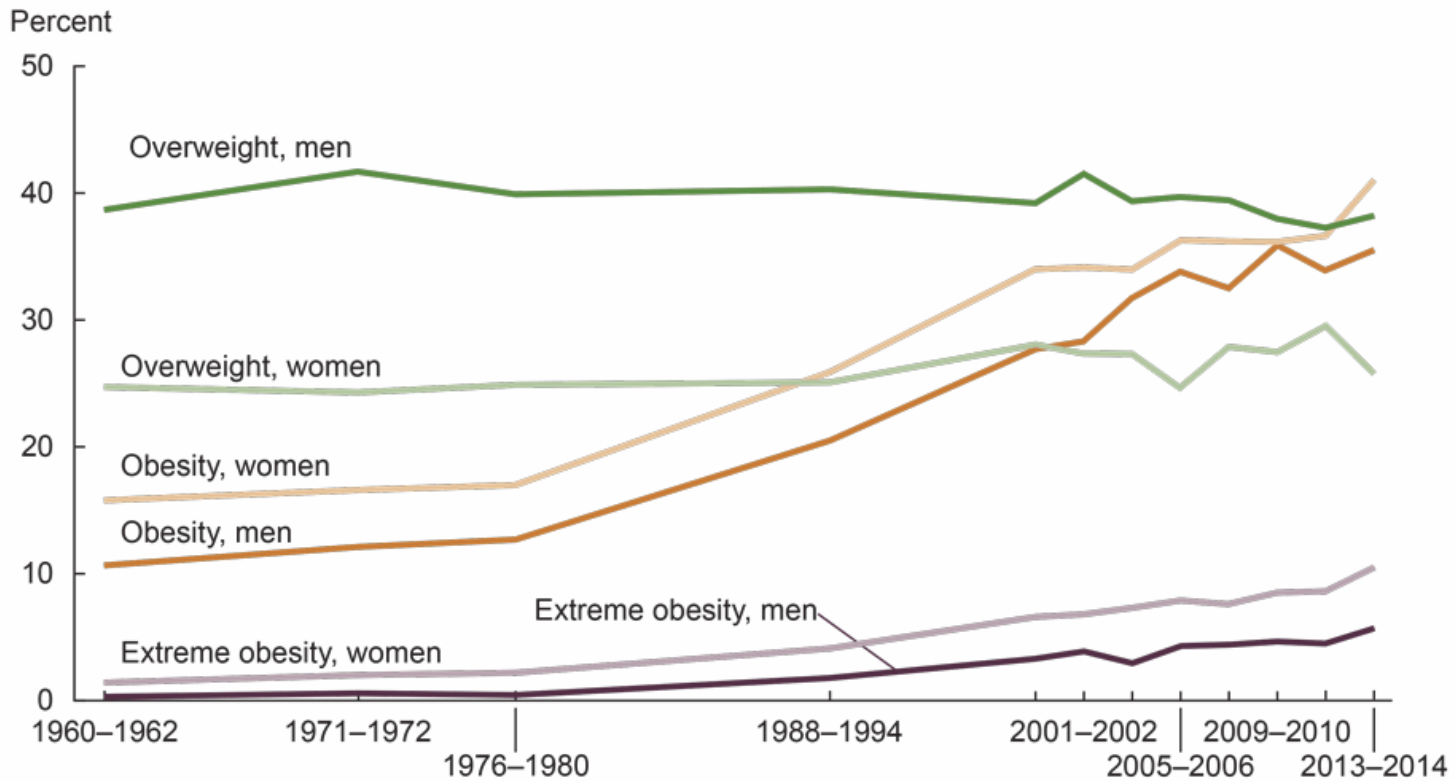


Figure. Trends in adult overweight, obesity, and extreme obesity among men and women aged 20–74: United States, 1960–1962 through 2013–2014

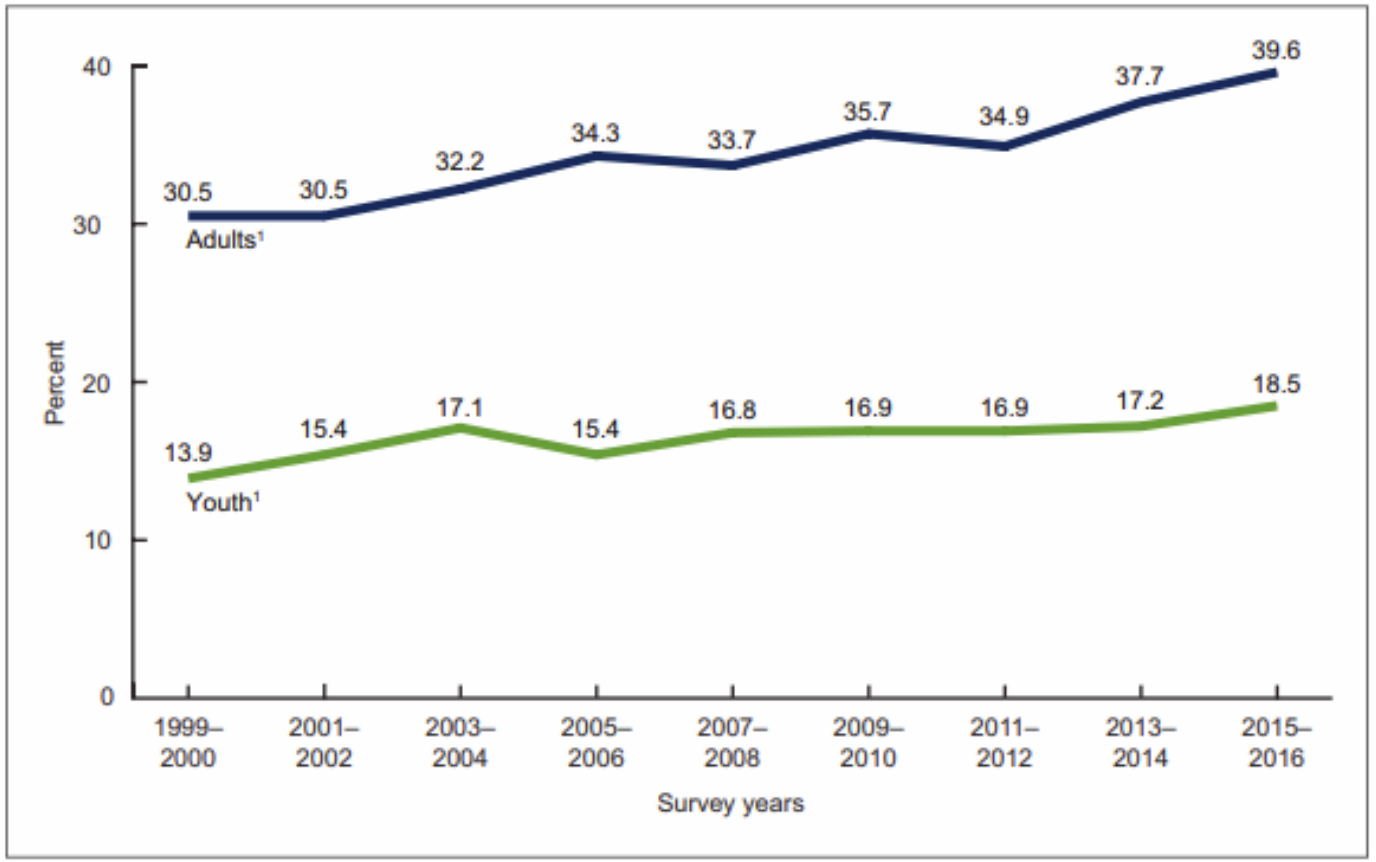


NOTES: Age-adjusted by the direct method to the year 2000 U.S. Census Bureau estimates using age groups 20–39, 40–59, and 60–74. Overweight is body mass index (BMI) of 25 kg/m^2 or greater but less than 30 kg/m^2; obesity is BMI greater than or equal to 30; and extreme obesity is BMI greater than or equal to 40. Pregnant females were excluded from the analysis.
SOURCES: NCHS, National Health Examination Survey and National Health and Nutrition Examination Surveys.

What are the trends in adult and childhood obesity?

From 1999–2000 through 2015–2016, a significantly increasing trend in obesity was observed in both adults and youth. The observed change in prevalence between 2013–2014 and 2015–2016, however, was not significant among both adults and youth (Figure 5).

Figure 5. Trends in obesity prevalence among adults aged 20 and over (age adjusted) and youth aged 2–19 years: United States, 1999–2000 through 2015–2016



[1]Significant increasing linear trend from 1999–2000 through 2015–2016.
NOTES: All estimates for adults are age adjusted by the direct method to the 2000 U.S. census population using the age groups 20–39, 40–59, and 60 and over.
Access data table for Figure 5 at: https://www.cdc.gov/nchs/data/databriefs/db288_table.pdf#5.
SOURCE: NCHS, National Health and Nutrition Examination Survey, 1999–2016.

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Chicago fattest city in U.S.

January 6, 2006

BY MEGAN REICHGOTT ASSOCIATED PRESS

Put down that slice of deep-dish pizza, Chicago.

The "City of Big Shoulders" is now the city with the thickest waistline, according to an annual survey.

Men's Fitness magazine has named Chicago the nation's fattest city,

In 1980, 46% of US adults age 20 and older were overweight or obese; by 1999, the number had increased to 60%. This dramatic increase has coincided with several trends:

• Higher energy intake from larger portion at home and at restaurants ("super-sizing")

• Greater consumption of high-fat foods

• Widespread availability of low-cost, good-tasting, energy-dense foods

• Decreased physical activity at work, at home, and during leisure time.

At any given time, 44% of women and 29% of men are dieting

Americans spend $50 billion a year on weight-loss products, programs, and pills

Costs of obesity?

Q: What is the cost of obesity?
A: Total cost: $147 billion , Direct cost: $65 billion,* Indirect cost: $56 billion (comparable to the economic costs of cigarette smoking)

Q: What is the cost of heart disease related to overweight and obesity?
A: Direct cost: $8.8 billion (17 percent of the total direct cost of heart disease, independent of stroke)

Q: What is the cost of type 2 diabetes related to overweight and obesity?
A: Total cost: $98 billion (in 2001)

Q: What is the cost of osteoarthritis related to overweight and obesity?
A: Total cost: $21.2 billion, Direct cost: $5.3 billion, Indirect cost: $15.9 billion

Q: What is the cost of hypertension (high blood pressure) related to overweight and obesity?
A: Direct cost: $4.1 billion (17 percent of the total cost of hypertension)

Q: What is the cost of gallbladder disease related to overweight and obesity?
A: Total cost: $3.4 billion, Direct cost: $3.2 billion, Indirect cost: $187 million

More costs…

Q: What is the cost of cancer related to overweight and obesity?

- Breast cancer: Total cost: $2.9 billion, Direct cost: $1.1 billion, Indirect cost: $1.8 billion
- Endometrial cancer: Total cost: $933 million, Direct cost: $310 million, Indirect cost: $623 million
- Colon cancer: Total cost: $3.5 billion, Direct cost: $1.3 billion, Indirect cost: $2.2 billion

Q: What is the cost of lost productivity related to obesity?

- The cost of lost productivity related to obesity (BMI $\geq$ 30) among Americans ages 17–64 is $3.9 billion. This value considers the following annual numbers (for 1994):
- Workdays lost related to obesity: 39.3 million
- Physician office visits related to obesity: 62.7 million
- Restricted activity days related to obesity: 239.0 million
- Bed-days related to obesity: 89.5 million

Medical Complications of Obesity

Pulmonary disease
abnormal function
obstructive sleep apnea
hypoventilation syndrome

Nonalcoholic fatty liver disease
steatosis
steatohepatitis
cirrhosis

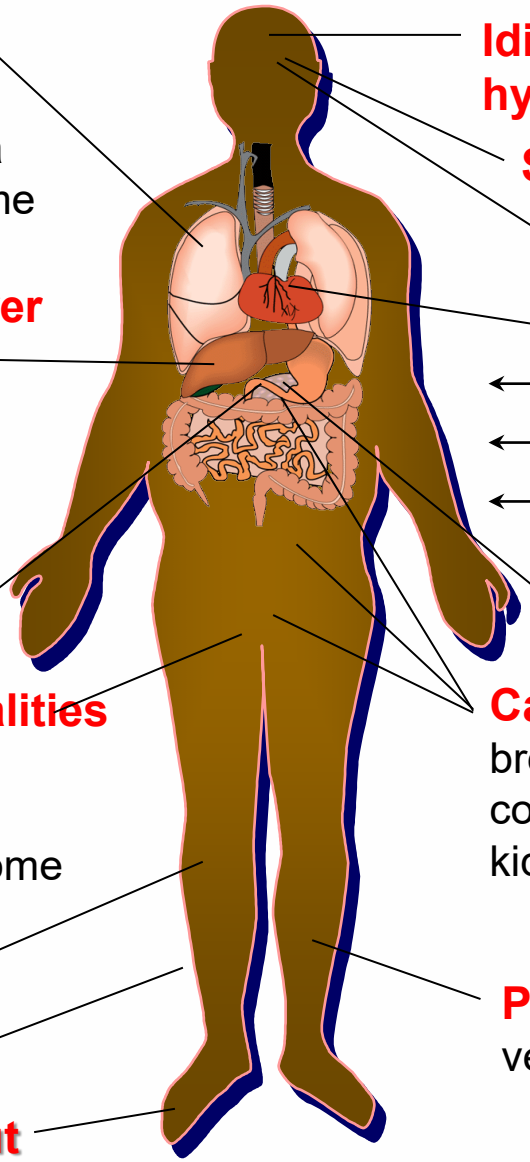
Gall bladder disease

Gynecologic abnormalities
abnormal menses
infertility
polycystic ovarian syndrome

Osteoarthritis

Skin

Gout



Idiopathic intracranial hypertension

Stroke

Cataracts

Coronary heart disease

Diabetes

Dyslipidemia

Hypertension

Severe pancreatitis

Cancer
breast, uterus, cervix
colon, esophagus, pancreas
kidney, prostate

Phlebitis
venous stasis

Complications no one talks about

- Not fitting in CT scanner
- Abdominal surgery and healing
- Medical emergencies-can they carry you?
- Difficulty dosing medications
- Operating tables not capable
- Not fitting in airplane

Diets Failing

50-70% weight regain rates in year 1

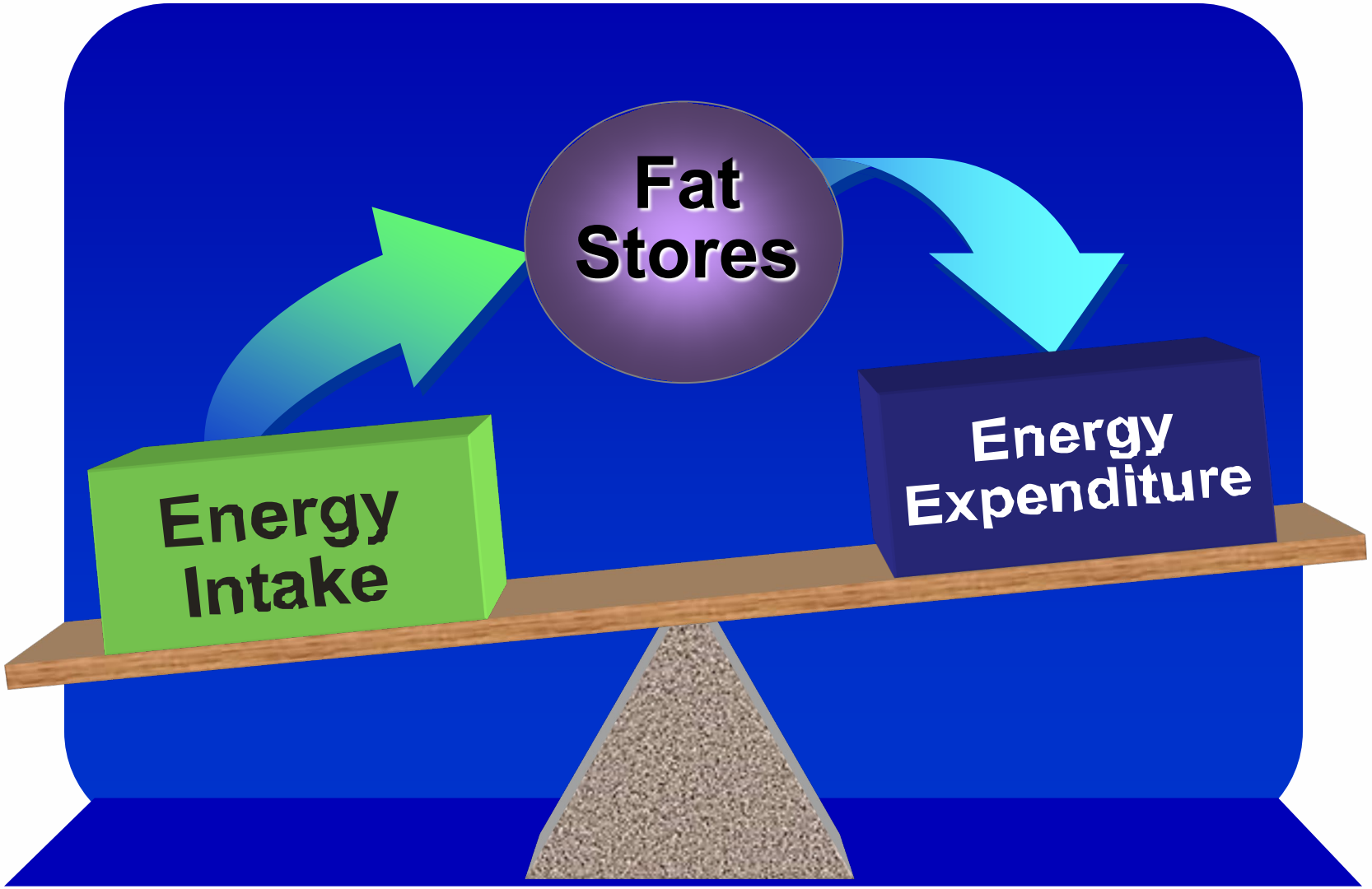
85% within 2 years

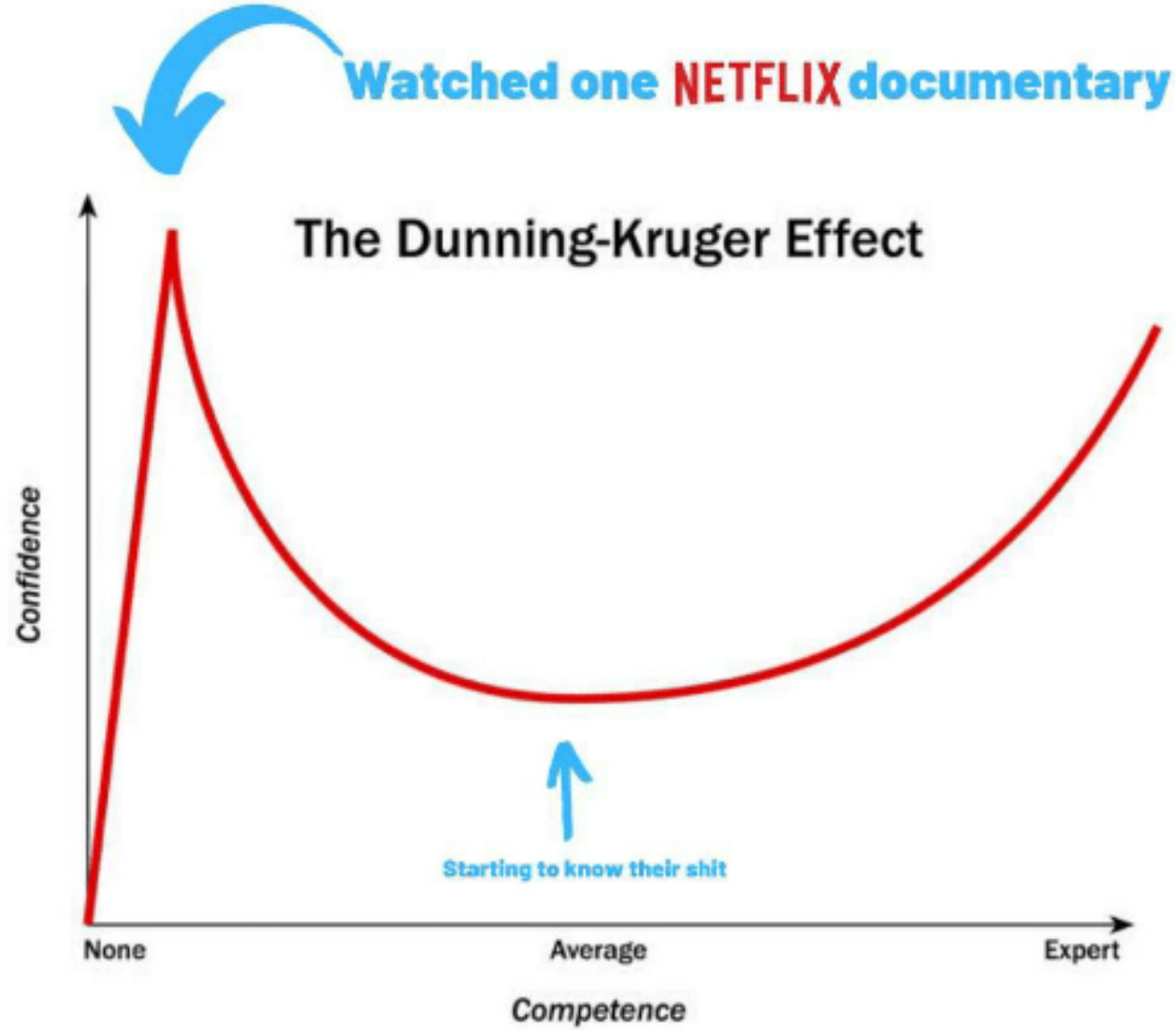
95% in 3 years

33-66% will add back more wight than they lost

But 5% of people lose weight and keep it off past 5 years!

Simple?

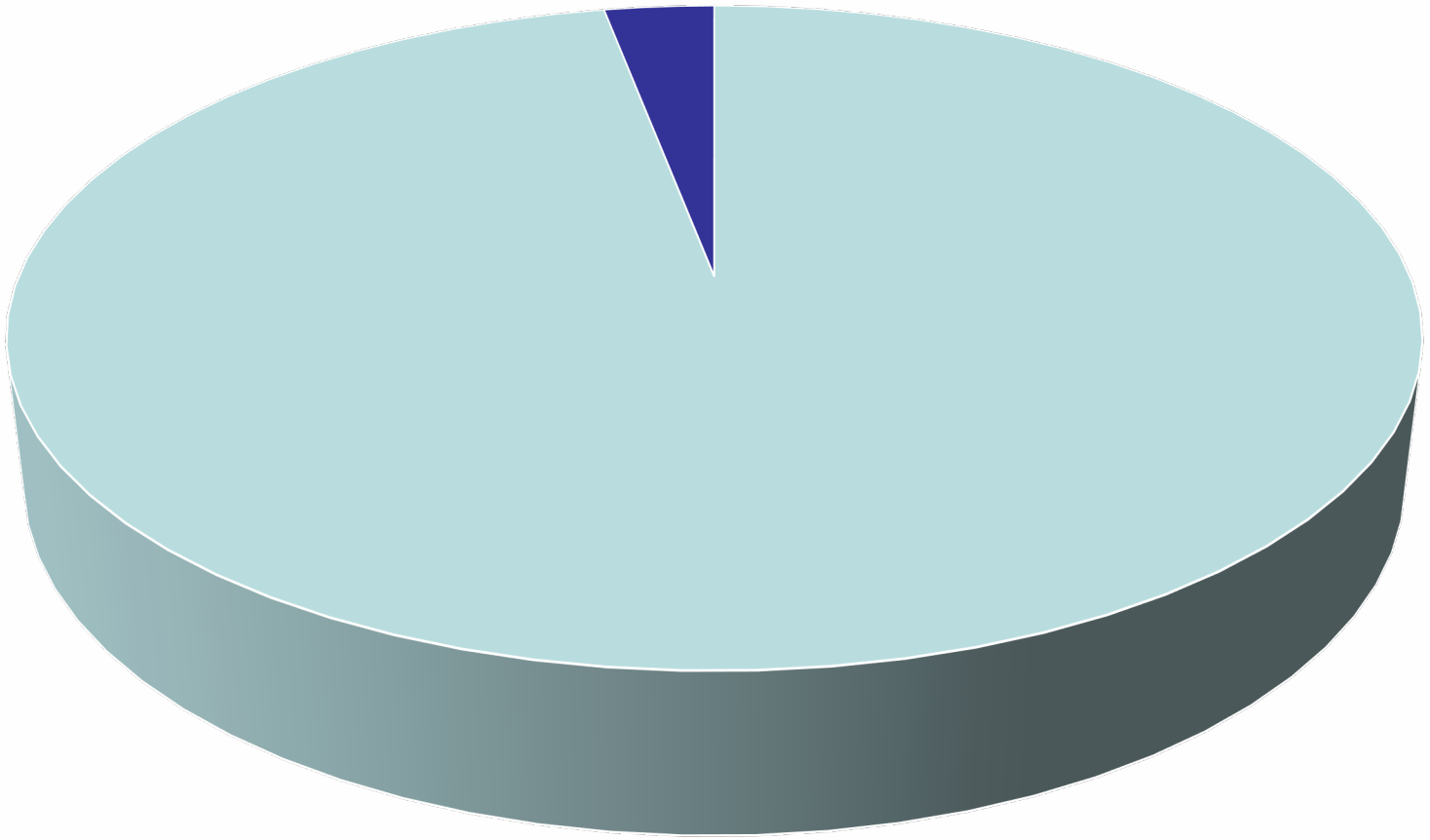




Dunning Kruger

Diet or Exercise?

What is more important in determining your body composition?



97% Diet

3% Exercise

Component of TDEE	% of TDEE (approximate)	Definition	Change during Weight Loss
Basal Metabolic Rate (BMR)	70%	Amount of energy required to keep bodily functions processing at rest	Weight loss reduces metabolically active tissue which decreases BMR
Non-Exercise Activity Thermogenesis (NEAT)	15%	Energy expended during "non-exercise" movement such as fidgeting or normal daily activities	Evidence suggests that NEAT is decreased when in caloric restriction and remain reduced even after subjects return to freely feeding.
Thermic Effect of Food (TEF)	10%	Energy expended during process of ingesting, absorbing, metabolizing, and storing nutrients from food	Magnitude maintains but overall reduction because of caloric restriction
Exercise Activity Thermogenesis (EAT)	5%	Energy used during exercise	Exercise will increase this component but as you continue exercising with a weight loss goal, a reduction in body mass will reduce the energy requirement needed to complete a given amount of activity. Meaning as you lose weight, you expend less energy for the same amount of activity.

Modified from Trexler, Smith-Ryan, & Norton, 2014. [8] **Trexler, E. T., Smith-Ryan, A. E., & Norton, L. E. (2014). Metabolic adaptation to weight loss: implications for the athlete. Journal of the International Society of Sports Nutrition, 11(1), 7.**

Calorie Expenditure 30 minutes Exercise

Activity Mode	110 lbs.	143 lbs.	187 lbs.	220 lbs.
Aerobic Dance	150	253	433	599
Moderate Cycling (12-13.9 mph)	184	311	531	735
Circuit Training	184	311	531	735
Bodybuilding/Powerlifting	139	232	397	551
Rowing, Moderate 100W	160	273	464	646
Running (10 min./mi.)	231	389	665	919
Running (7 min./mi.)	323	543	938	1286
Basketball Game	184	311	531	735
Boxing, Sparring	139	348	598	830
Soccer Game	231	389	665	919
Walking 3.0mph	76	130	219	305
Swimming Laps	231	389	665	919
Energy Expenditure (kcal/min) = (METs x 3.5 x Body Mass)/200				

Hoffman, Jay. Norms for Fitness, Performance, and Health. Human Kinetics, 2006. [9] **Hoffman, J. (2006). Norms for fitness, performance, and health. Champaign, IL: Human Kinetics.**

Day of Week	Exercise Type and Time	Calorie Expenditure
Monday	Strength Training, 45 min.	826
	Walking (3.0 mph), 15 min.	152
Wednesday	Strength Training, 45 min.	826
	Walking (3.0 mph), 15 min.	152
Friday	Strength Training, 45 min.	826
	Walking (3.0 mph), 15 min.	152
Total Caloric Expenditure		***2934***

Still doesn’t add up to 3500 kcal which is required to burn 1 pound per week.

A 3-month randomized, controlled study **[4]** recruited 43 overweight or obese adolescent boys (12-18 years old) who were physically inactive which was quantified as no participation in structured physical activity over the previous 3 months except school physical education classes. All subjects were asked to follow a weight maintenance diet during the 3-month intervention period to determine the effects of exercise without caloric restriction. Subjects were split into three groups: aerobic exercise, resistance training, or control. The aerobic exercise program consisted of treadmill, elliptical, or stationary bike sessions three times per week for 60 minutes per session at approximately 50% of VO2peak and increased to 60 minutes at 60-75% of VO2peak by week two. The resistance training program consisted of ten exercises such as leg press, chest press, latissimus pull downs, seated row, among others. The week 1-4 protocol was to perform 1-2 sets of 8-12 repetitions at 60% of baseline. During weeks 4-12, subjects performed two sets of 8-12 repetitions to fatigue.

While these are not the most challenging training protocols known to mankind, keep in mind that these are adolescent boys who have puberty to thank for the plethora of androgenic hormones pumping through their veins for the first time and they are also novice exercisers which will allow them to make faster progress than any other population. These two factors, adolescent in age and novice exercisers, should create a perfect cocktail where exercise could make a huge impact on body composition.

However, the data showed that after three months, exercise had very little impact on weight loss. (Remember, 1 lb.= 2.2 kgs.)

- Control group gained 2.6 + 1.0 kg body weight
- Aerobic exercise group lost 0.04 + 0.8 kg body weight
- Resistance training group lost 0.6 + 0.8 kg body weight

Another study **[5]** recruited 65 adults who completed an exercise protocol in which they were randomly assigned to one of two exercise groups: aerobic exercise or combined aerobic and resistance exercise. Aerobic exercise progressed from 15 minutes three times per week to 30-45 minutes five days per week over the course of 12 weeks. The combined aerobic and resistance exercise protocol consisted of the same aerobic exercise in addition to a twice per week strength training regimen which consisted of six compound strength training exercises designed to work large muscle groups for up to 3-6 sets and 10 repetitions beginning at 50% 1RM the first four weeks and transitioning to 2-3 sets and 10 repetitions at 75-80% 1RM.

At the conclusion of 12 weeks, the aerobic group lost 3.7 kgs body weight and the aerobic + resistance lost 3.8 kgs body weight, which although statistically significant, it is less than 9 lbs.

A 16-month study **[6]** with 74 participants aged 17-35 years were assigned to either a control group or exercise group. All participants were previously sedentary and did not expend more than 500 calories on physical activity per week. The exercise was primarily done on a treadmill, progressing from 20 minutes at baseline to 45 minutes at 6 months. The exercise intensity progressed from 60% heart rate reserve at baseline to 75% at 6 months.

Participants were required to expend 400 calories per exercise session and approximately 2000 calories per week, which was achieved throughout the course of the study. Energy intake was ad libitum and was measured at baseline and 5 other time points over the 16 months.

At the conclusion of the study, the men in the exercise group had only lost 5.2 kg body weight while the women lost only 0.4 kg body weight.

A meta-analysis found the mean weight loss of men who completed 30 weeks of exercise was a measly 2.6 kg. Women compared similarly, on average losing 3.0 kg over the course of 14 weeks.

Garrow, J. S., & Summerbell, C. D. (1995). Meta-analysis: effect of exercise, with or without dieting, on the body composition of overweight subjects. European journal of clinical nutrition, 49(1), 1-10.

Am J Clin Nutr. 2014 Jan;99(1):14-23. doi: 10.3945/ajcn.113.070052. Epub 2013 Oct 30.

Effects of anti-obesity drugs, diet, and exercise on weight-loss maintenance after a very-low-calorie diet or low-calorie diet: a systematic review and meta-analysis of randomized controlled trials.

Johansson K[1], Neovius M, Hemmingsson E.

Author information

Abstract

BACKGROUND: Weight-loss maintenance remains a major challenge in obesity treatment.

OBJECTIVE: The objective was to evaluate the effects of anti-obesity drugs, diet, or exercise on weight-loss maintenance after an initial very-low-calorie diet (VLCD)/low-calorie diet (LCD) period (<1000 kcal/d).

DESIGN: We conducted a systematic review by using MEDLINE, the Cochrane Controlled Trial Register, and EMBASE from January 1981 to February 2013. We included randomized controlled trials that evaluated weight-loss maintenance strategies after a VLCD/LCD period. Two authors performed independent data extraction by using a predefined data template. All pooled analyses were based on random-effects models.

RESULTS: Twenty studies with a total of 27 intervention arms and 3017 participants were included with the following treatment categories: anti-obesity drugs (3 arms; n = 658), meal replacements (4 arms; n = 322), high-protein diets (6 arms; n = 865), dietary supplements (6 arms; n = 261), other diets (3 arms; n = 564), and exercise (5 arms; n = 347). During the VLCD/LCD period, the pooled mean weight change was -12.3 kg (median duration: 8 wk; range 3-16 wk). Compared with controls, anti-obesity drugs improved weight-loss maintenance by 3.5 kg [95% CI: 1.5, 5.5 kg; median duration: 18 mo (12-36 mo)], meal replacements by 3.9 kg [95% CI: 2.8, 5.0 kg; median duration: 12 mo (10-26 mo)], and high-protein diets by 1.5 kg [95% CI: 0.8, 2.1 kg; median duration: 5 mo (3-12 mo)]. Exercise [0.8 kg; 95% CI: -1.2, 2.8 kg; median duration: 10 mo (6-12 mo)] and dietary supplements [0.0 kg; 95% CI: -1.4, 1.4 kg; median duration: 3 mo (3-14 mo)] did not significantly improve weight-loss maintenance compared with control.

CONCLUSION: Anti-obesity drugs, meal replacements, and high-protein diets were associated with improved weight-loss maintenance after a VLCD/LCD period, whereas no significant improvements were seen for dietary supplements and exercise.

PMID: 24172297 [PubMed - indexed for MEDLINE] PMCID: PMC3862452

- Exercise helps you not gain weight back that you have already lost

Am J Physiol Regul Integr Comp Physiol. 2009 Sep;297(3):R793-802. doi: 10.1152/ajpregu.00192.2009. Epub 2009 Jul 8.

Regular exercise attenuates the metabolic drive to regain weight after long-term weight loss.

MacLean PS[1], Higgins JA, Wyatt HR, Melanson EL, Johnson GC, Jackman MR, Giles ED, Brown IE, Hill JO.

Author information

Abstract

Weight loss is accompanied by several metabolic adaptations that work together to promote rapid, efficient regain. We employed a rodent model of regain to examine the effects of a regular bout of treadmill exercise on these adaptations. Obesity was induced in obesity-prone rats with 16 wk of high-fat feeding and limited physical activity. Obese rats were then weight reduced (approximately 14% of body wt) with a calorie-restricted, low-fat diet and maintained at that reduced weight for 8 wk by providing limited provisions of the diet with (EX) or without (SED) a daily bout of treadmill exercise (15 m/min, 30 min/day, 6 days/wk). Weight regain, energy balance, fuel utilization, adipocyte cellularity, and humoral signals of adiposity were monitored during eight subsequent weeks of ad libitum feeding while the rats maintained their respective regimens of physical activity. Regular exercise decreased the rate of regain early in relapse and lowered the defended body weight. During weight maintenance, regular exercise reduced the biological drive to eat so that it came closer to matching the suppressed level of energy expenditure. The diurnal extremes in fuel preference observed in weight-reduced rats were blunted, since exercise promoted the oxidation of fat during periods of feeding (dark cycle) and promoted the oxidation of carbohydrate (CHO) later in the day during periods of deprivation (light cycle) . At the end of relapse, exercise reestablished the homeostatic steady state between intake and expenditure to defend a lower body weight. Compared with SED rats, relapsed EX rats exhibited a reduced turnover of energy, a lower 24-h oxidation of CHO, fewer adipocytes in abdominal fat pads, and peripheral signals that overestimated their adiposity. These observations indicate that regimented exercise altered several metabolic adaptations to weight reduction in a manner that would coordinately attenuate the propensity to regain lost weight.

PMID: 19587114 [PubMed - indexed for MEDLINE] PMCID: PMC2739786 **Free PMC Article**

Br J Sports Med doi:10.1136/bjsm.2009.065557

Original article

Beneficial effects of exercise: shifting the focus from body weight to other markers of health

Neil King[1,*], **Mark Hopkins**[2], **Phillipa Caudwell**[3], **James Stubbs**[4], **John Blundell**[3]

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Abstract

Background: Exercise is widely promoted as a method of weight management, whilst the other health benefits are often ignored. The purpose of this study was to examine whether exercise-induced improvements in health are influenced by changes in body weight.

Methods: Fifty-eight sedentary overweight/obese men and women (BMI 31.8 ±4.5kg/m2) participated in a 12 week supervised aerobic exercise intervention (70% heart rate max, 5 times a week, 500kcal per session). Body composition, anthropometric parameters, aerobic capacity, blood pressure and acute psychological response to exercise were measured at weeks 0 and 12.

Results: Mean reduction in body weight was -3.3 ±3.63kg (P<0.01). However, 26 of the 58 participants failed to attain the predicted weight loss estimated from individuals' exercise-induced energy expenditure. Their mean weight loss was only -0.9 ±1.8kg (P<0.01). Despite attaining lower than predicted weight reduction, these individuals experienced significant increases in aerobic capacity (6.3 ±6.0ml.kg-1.min-1; P<0.01), decreased systolic (-6.00 ±11.5mmHg; P<0.05) and diastolic blood pressure (-3.9 ±5.8mmHg; P<0.01), waist circumference (-3.7 ±2.7cm; P<0.01) and resting heart rate (-4.8±8.9bpm, p<0.001). In addition, these individuals experienced an acute exercise-induced increase in positive mood.

Conclusions: These data demonstrate that significant and meaningful health benefits can be achieved even in the presence of lower than expected exercise-induced weight loss. Less successful reduction in body weight does not undermine the beneficial effects of aerobic exercise. From a public health perspective, exercise should be encouraged and the emphasis on weight loss reduced.

J Acad Nutr Diet. 2014 Oct;114(10):1557-68. doi: 10.1016/j.jand.2014.07.005.

Diet or exercise interventions vs combined behavioral weight management programs: a systematic review and meta-analysis of direct comparisons.

Johns DJ, Hartmann-Boyce J, Jebb SA, Aveyard P; Behavioural Weight Management Review Group.

Abstract

Weight loss can reduce the health risks associated with being overweight or obese. However, the most effective method of weight loss remains unclear. Some programs emphasize physical activity, others diet, but existing evidence is mixed as to whether these are more effective individually or in combination. We aimed to examine the clinical effectiveness of combined behavioral weight management programs (BWMPs) targeting weight loss in comparison to single component programs, using within study comparisons. We included randomized controlled trials of combined BWMPs compared with diet-only or physical activity-only programs with at least 12 months of follow-up, conducted in overweight and obese adults (body mass index ≥25). Systematic searches of nine databases were run and two reviewers extracted data independently. Random effects meta-analyses were conducted for mean difference in weight change at 3 to 6 months and 12 to 18 months using a baseline observation carried forward approach for combined BWMPs vs diet-only BWMPs and combined BWMPs vs physical activity-only BWMPs. In total, eight studies were included, representing 1,022 participants, the majority of whom were women. Six studies met the inclusion criteria for combined BWMP vs diet-only. Pooled results showed no significant difference in weight loss from baseline or at 3 to 6 months between the BWMPs and diet-only arms (-0.62 kg; 95% CI -1.67 to 0.44). However, at 12 months, a significantly greater weight-loss was detected in the combined BWMPs (-1.72 kg; 95% CI -2.80 to -0.64). Five studies met the inclusion criteria for combined BWMP vs physical activity-only. Pooled results showed significantly greater weight loss in the combined BWMPs at 3 to 6 months (-5.33 kg; 95% CI -7.61 to -3.04) and 12 to 18 months (-6.29 kg; 95% CI -7.33 to -5.25). Weight loss is similar in the short-term for diet-only and combined BWMPs but in the longer-term weight loss is increased when diet and physical activity are combined. Programs based on physical activity alone are less effective than combined BWMPs in both the short and long term.

KEYWORDS: Behavioral programme; Diet; Exercise; Obesity; Weight loss

PMID: 25257365 [PubMed - in process] PMCID: PMC4180002 **Free PMC Article**

Obes Rev. 2009 May;10(3):313-23. doi: 10.1111/j.1467-789X.2008.00547.x. Epub 2009 Jan 19.

Long-term effectiveness of diet-plus-exercise interventions vs. diet-only interventions for weight loss: a meta-analysis.

Wu T[1], Gao X, Chen M, van Dam RM.

Author information

Abstract

Diet and exercise are two of the commonest strategies to reduce weight. Whether a diet-plus-exercise intervention is more effective for weight loss than a diet-only intervention in the long-term has not been conclusively established. The objective of this study was to systemically review the effect of diet-plus-exercise interventions vs. diet-only interventions on both long-term and short-term weight loss. Studies were retrieved by searching MEDLINE and Cochrane Library (1966 - June 2008). Studies were included if they were randomized controlled trials comparing the effect of diet-plus-exercise interventions vs. diet-only interventions on weight loss for a minimum of 6 months among obese or overweight adults. Eighteen studies met our inclusion criteria. Data were independently extracted by two investigators using a standardized protocol. We found that the overall standardized mean differences between diet-plus-exercise interventions and diet-only interventions at the end of follow-up were -0.25 (95% confidence interval [CI]-0.36 to -0.14), with a P-value for heterogeneity of 0.4. Because there were two outcome measurements, weight (kg) and body mass index (kg m(-2)), we also stratified the results by weight and body mass index outcome. The pooled weight loss was 1.14 kg (95% CI 0.21 to 2.07) or 0.50 kg m(-2) (95% CI 0.21 to 0.79) greater for the diet-plus-exercise group than the diet-only group. We did not detect significant heterogeneity in either stratum. Even in studies lasting 2 years or longer, diet-plus-exercise interventions provided significantly greater weight loss than diet-only interventions. In summary, a combined diet-plus-exercise programme provided greater long-term weight loss than a diet-only programme. However, both diet-only and diet-plus-exercise programmes are associated with partial weight regain, and future studies should explore better strategies to limit weight regain and achieve greater long-term weight loss.

PMID: 19175510 [PubMed - indexed for MEDLINE]

Even in the studies that showed that exercise plus diet worked, it was a 0.5 to 1.14Kg weight loss over 2 years. That's 1-2 pounds at the most.

Ann Intern Med. 2007 Jul 3;147(1):41-50.

Meta-analysis: the effect of dietary counseling for weight loss.

Dansinger ML[1], Tatsioni A, Wong JB, Chung M, Balk EM.

Author information

Abstract

BACKGROUND: Dietary and lifestyle modification efforts are the primary treatments for people who are obese or overweight. The effect of dietary counseling on long-term weight change is unclear.

PURPOSE: To perform a meta-analysis of the effect of dietary counseling compared with usual care on body mass index (BMI) over time in adults.

DATA SOURCES: Early studies (1980 through 1997) from a previously published systematic review; MEDLINE and the Cochrane Central Register of Controlled Trials from 1997 through July 2006.

STUDY SELECTION: English-language randomized, controlled trials (> or =16 weeks in duration) in overweight adults that reported the effect of dietary counseling on weight. The authors included only weight loss studies with a dietary component.

DATA EXTRACTION: Single reviewers performed full data extraction; at least 1 additional reviewer reviewed the data.

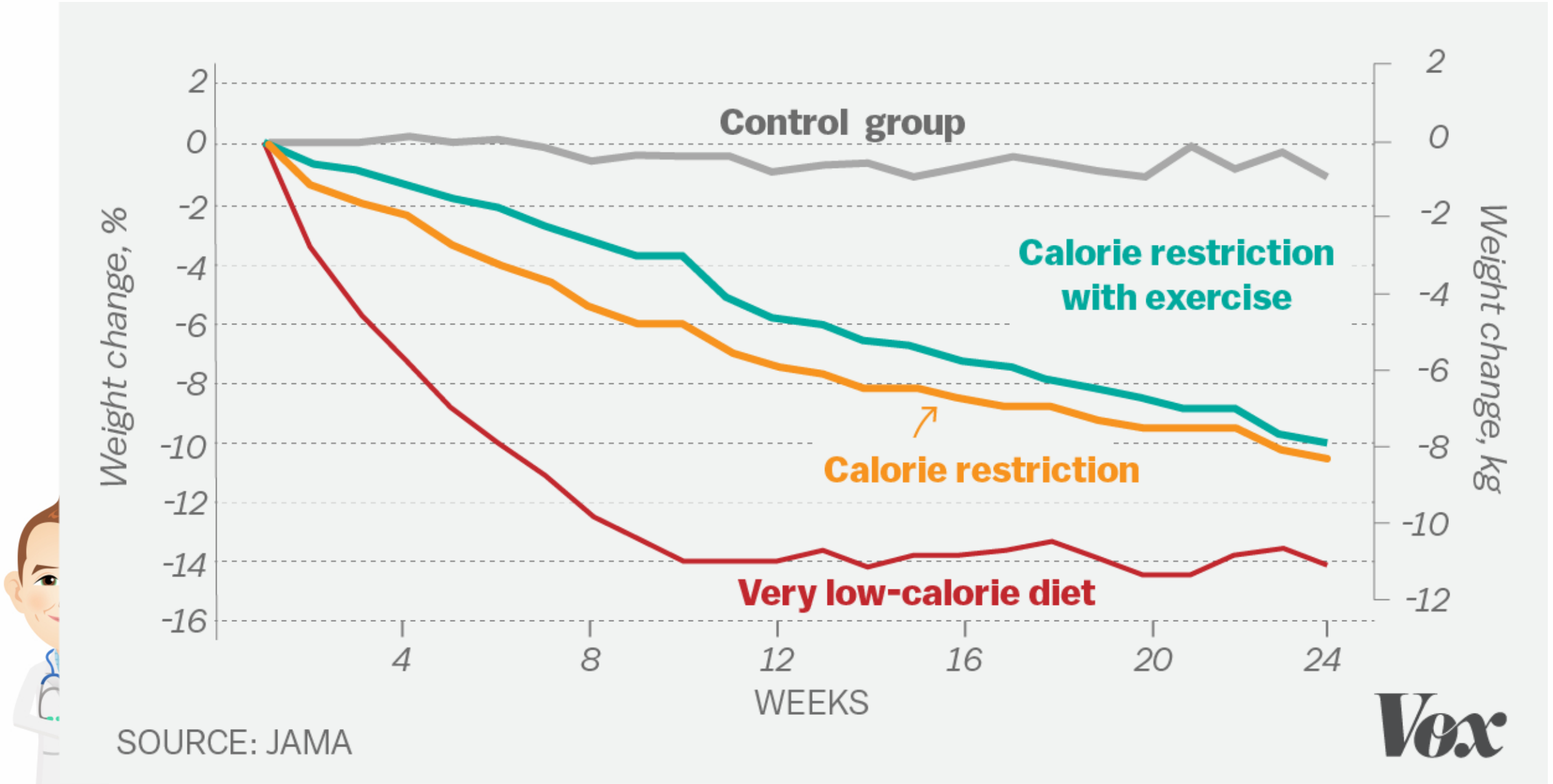
DATA SYNTHESIS: Random-effects model meta-analyses of 46 trials of dietary counseling revealed a maximum net treatment effect of -1.9 (95% CI, -2.3 to -1.5) BMI units (approximately -6%) at 12 months. Meta-analysis of changes in weight over time (slopes) and meta-regression suggest a change of approximately -0.1 BMI unit per month from 3 to 12 months of active programs and a regain of approximately 0.02 to 0.03 BMI unit per month during subsequent maintenance phases. Different analyses suggested that calorie recommendations, frequency of support meetings, inclusion of exercise, and diabetes may be independent predictors of weight change.

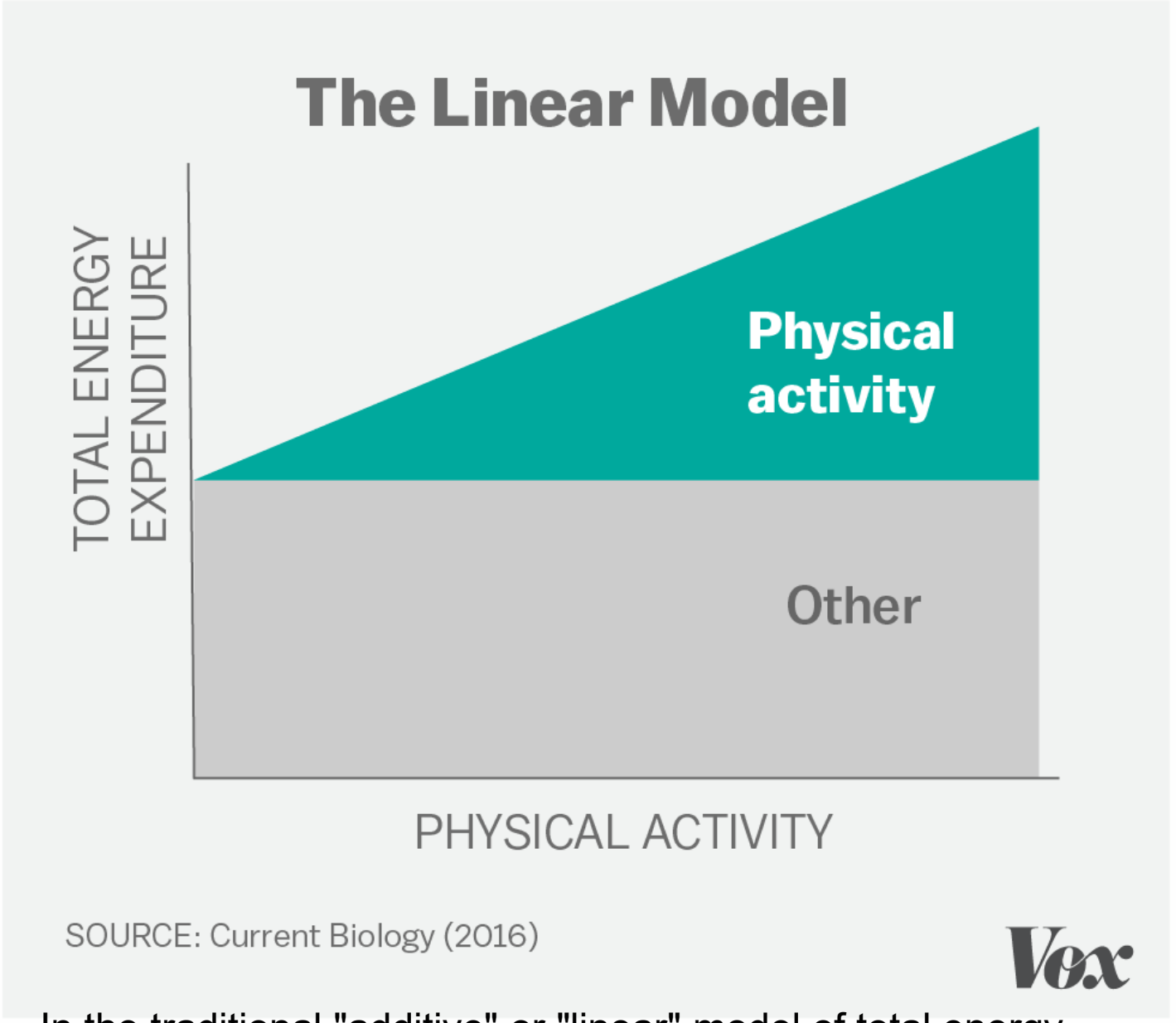
LIMITATIONS: The interventions, study samples, and weight changes were heterogeneous. Studies were generally of moderate to poor methodological quality. They had high rates of missing data and failed to explain these losses. The meta-analytic techniques could not fully account for these limitations.

CONCLUSIONS: Compared with usual care, dietary counseling interventions produce modest weight losses that diminish over time. In future studies, minimizing loss to follow-up and determining which factors result in more effective weight loss should be emphasized.

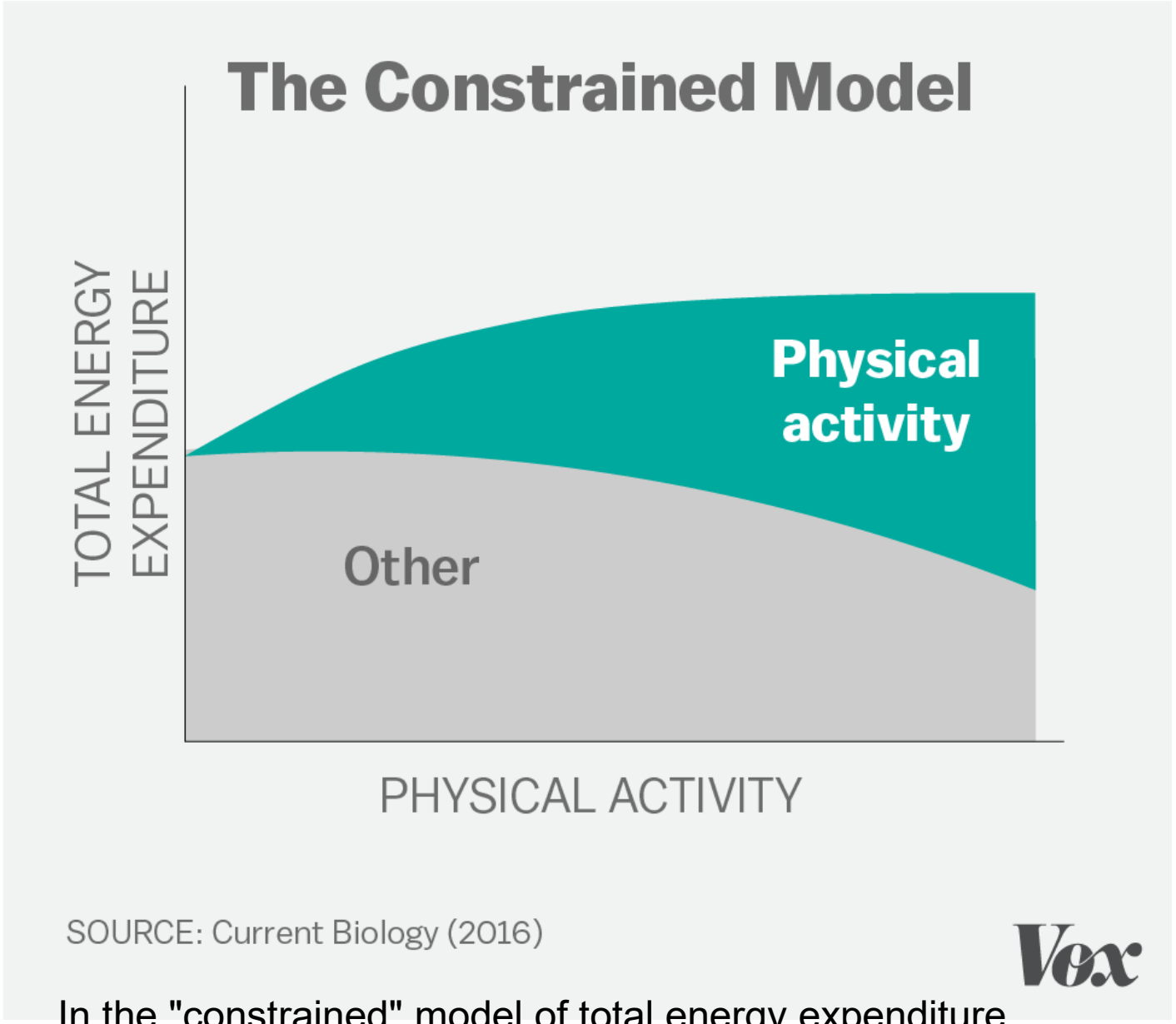
Comment in

Review: dietary counselling promotes modest weight loss, but the effect diminishes over time. [Evid Based Med. 2008]


Control group
Calorie restriction with exercise
Calorie restriction
Very low-calorie diet
Weight change, %
Weight change, kg
2
0
-2
-4
-6
-8
-10
-12
-14
-16
4
8
12
16
20
24
WEEKS
SOURCE: JAMA
Vox



In the traditional "additive" or "linear" model of total energy expenditure, how many calories one burns is a simple linear function of physical activity.



In the "constrained" model of total energy expenditure, the body adapts to increased physical activity by reducing energy spent on other physiological activities.

Constrained Total Energy Expenditure and Metabolic Adaptation to Physical Activity in Adult Humans

Herman Pontzer Ramon Durazo-Arvizu Lara R. Dugas Richard S. Cooper Dale A. Schoeller Amy Luke
https://doi.org/10.1016/j.cub.2015.12.046

Highlights

•We measured total energy expenditure and physical activity in a large adult sample

•Above moderate activity levels, total energy expenditure plateaued

•Body fat percentage was positively related to total energy expenditure

•Activity intensity was inversely related to total energy expenditure

Summary

Current obesity prevention strategies recommend increasing daily physical activity, assuming that increased activity will lead to corresponding increases in total energy expenditure and prevent or reverse energy imbalance and weight gain [1, 2 ,3]. Such Additive total energy expenditure models are supported by exercise intervention and accelerometry studies reporting positive correlations between physical activity and total energy expenditure [4] but are challenged by ecological studies in humans and other species showing that more active populations do not have higher total energy expenditure [5 , 6 , 7 , 8]. Here we tested a Constrained total energy expenditure model, in which total energy expenditure increases with physical activity at low activity levels but plateaus at higher activity levels as the body adapts to maintain total energy expenditure within a narrow range. We compared total energy expenditure, measured using doubly labeled water, against physical activity, measured using accelerometry, for a large (n = 332) sample of adults living in five populations [9]. After adjusting for body size and composition, total energy expenditure was positively correlated with physical activity, but the relationship was markedly stronger over the lower range of physical activity. For subjects in the upper range of physical activity, total energy expenditure plateaued, supporting a Constrained total energy expenditure model. Body fat percentage and activity intensity appear to modulate the metabolic response to physical activity. Models of energy balance employed in public health [1 , 2 , 3] should be revised to better reflect the constrained nature of total energy expenditure and the complex effects of physical activity on metabolic physiology.

Homeostatic and non-homeostatic appetite control along the spectrum of physical activity levels: An updated perspective

Kristine Beaulieu [1], Mark Hopkins [2], John Blundell [3], Graham Finlayson [3]
Affiliations
•PMID: 29289613
•DOI: 10.1016/j.physbeh.2017.12.032
Free article

Abstract

The current obesogenic environment promotes physical inactivity and food consumption in excess of energy requirements, two important modifiable risk factors influencing energy balance. Habitual physical activity has been shown to impact not only energy expenditure, but also energy intake through mechanisms of appetite control. This review summarizes recent theory and evidence underpinning the role of physical activity in the homeostatic and non-homeostatic mechanisms controlling appetite. Energy intake along the spectrum of physical activity levels (inactive to highly active) appears to be J-shaped, with low levels of physical activity leading to dysregulated appetite and a mismatch between energy intake and expenditure. At higher levels, habitual physical activity influences homeostatic appetite control in a dual-process action by increasing the drive to eat through greater energy expenditure, but also by enhancing post-meal satiety, allowing energy intake to better match energy expenditure in response to hunger and satiety signals. There is clear presumptive evidence that physical activity energy expenditure can act as a drive (determinant) of energy intake. The influence of physical activity level on non-homeostatic appetite control is less clear, but low levels of physical activity may amplify hedonic states and behavioural traits favouring overconsumption indirectly through increased body fat. More evidence is required to understand the interaction between physical activity, appetite control and diet composition on passive overconsumption and energy balance. Furthermore, potential moderators of appetite control along the spectrum of physical activity, such as body composition, sex, and type, intensity and timing of physical activity, remain to be fully understood.

Key Points

1. Physical activity does more than just increase total energy expenditure. When activity is low, appetite is dysregulated, resulting in excess food intake and weight gain. Higher levels of activity seem to increase appetite control.

2. The combination of being too high in body fat and also being physically inactive may further dysregulate appetite and satiety signalling, making weight loss efforts even more difficult.

3. Physical activity and exercise may only be effective to a point for the goal of weight loss. At very high levels of physical activity, additional increases may not result in an increase in total energy expenditure, but rather a downregulation of energy expended from other components of total energy expenditure and no change in net expenditure.

Body adapts to exercise to the point where you are burning very few calories

And because you improve your cardiovascular endurance, it does become easier and you can do it using less calories

Physical activity, total and regional obesity: dose-response considerations

R Ross [1], I Janssen
Affiliations
•PMID: 11427779
•DOI: 10.1097/00005768-200106001-00023

Abstract

Purpose: This review was undertaken to determine whether exercise-induced weight loss was associated with corresponding reductions in total, abdominal, and visceral fat in a dose-response manner.

Methods: A literature search (MEDLINE, 1966--2000) was performed using appropriate keywords to identify studies that consider the influence of exercise-induced weight loss on total and/or abdominal fat. The reference lists of those studies identified were cross-referenced for additional studies.

Results: Total fat. Review of available evidence suggested that studies evaluating the utility of physical activity as a means of obesity reduction could be subdivided into two categories based on study duration. Short-term studies (< or = 16 wk, N = 20) were characterized by exercise programs that increased energy expenditure by values double (2200 vs 1100 kcal.wk-1) that of long-term studies (> or = 26 wk, N = 11). Accordingly, short-term studies report reductions in body weight (-0.18 vs -0.06 kg x wk(-1)) and total fat (-0.21 vs -0.06 kg x wk(-1)) that are threefold higher than those reported in long-term studies. Moreover, with respect to dose-response issues, the evidence from short-term studies suggest that exercise-induced weight loss is positively related to reductions in total fat in a dose-response manner. No such relationship was observed when the results from long-term studies were examined. Abdominal fat. Limited evidence suggests that exercise-induced weight loss is associated with reductions in abdominal obesity as measured by waist circumference or imaging methods; however, at present there is insufficient evidence to determine a dose-response relationship between physical activity, and abdominal or visceral fat.

Conclusion: In response to well-controlled, short-term trials, increasing physical activity expressed as energy expended per week is positively related to reductions in total adiposity in a dose-response manner. Although physical activity is associated with reduction in abdominal and visceral fat, there is insufficient evidence to determine a dose-response relationship.

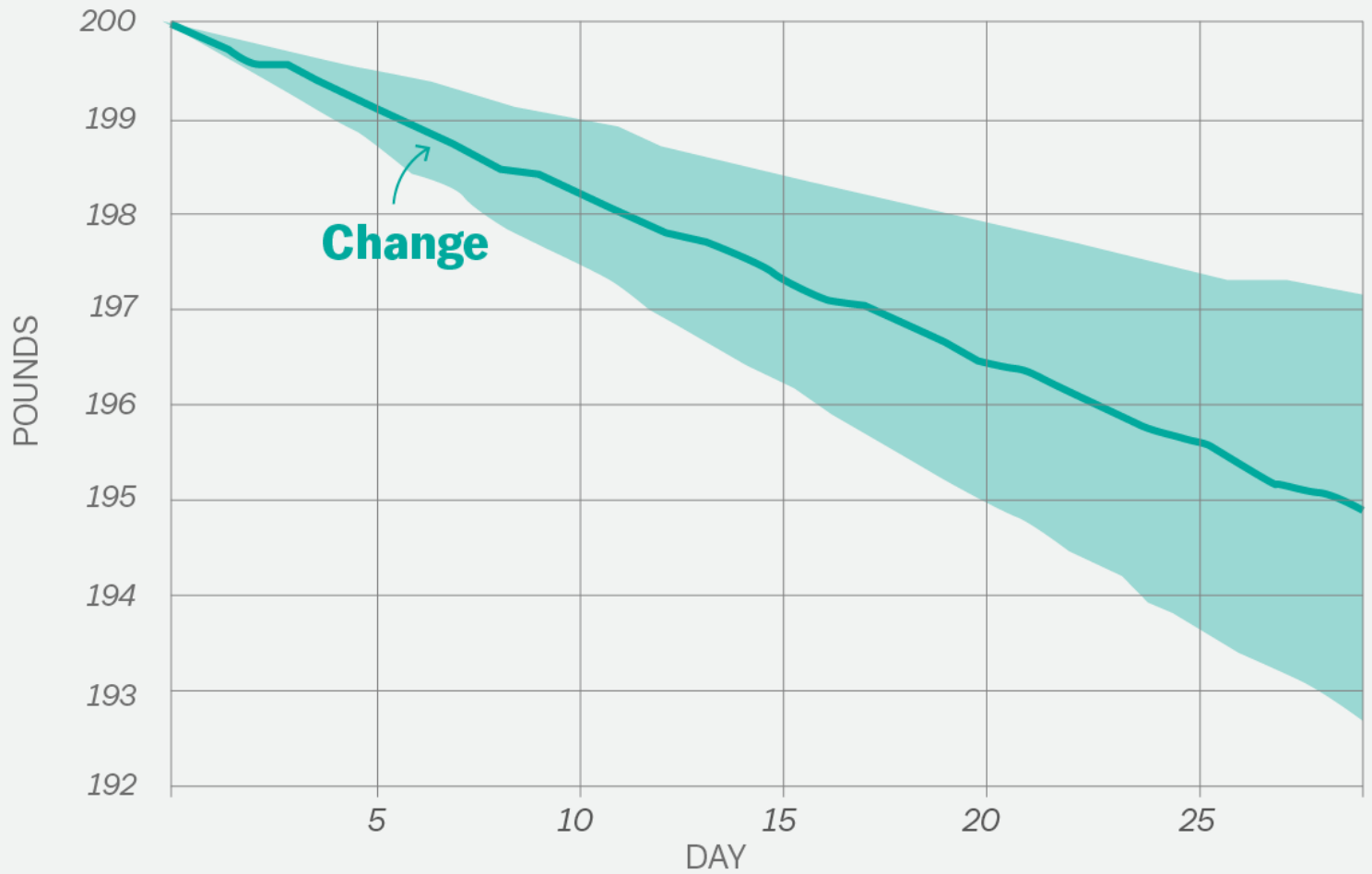
Exercise can cause fat loss short term ~3 months, but once adapted, no longer causes fat loss.

Exercise?

- The amount of exercise you'd have to do to lose weight is time prohibitive.
- Burning an extra 500 calories per day would require jogging for 5-6 miles per day.
- That may take 90 minutes
- Do not drink sugary sports drinks afterwards

- Exercise is good for keeping lost weight off, but will not help you lose weight
- Eating less and healthier is the key
- Exercise suppresses/increases appetite
- Exercise activates fight/flight response and puts the rest/digest system on hold
- Lowers cardiovascular mortality significantly
- Exercise alone ineffective for weight loss

Projected weight loss for a 200-pound man with 60 minutes of running four days per week



SOURCE: National Institutes of Health Body Weight Planner

Vox

Exercise

Improves cardiovascular mortality

Lowers BP, LDL, blood sugar

Increase HDL

Prevents weight re-gain

Increase/Decrease hunger

Activates compensatory adaptive mechanisms

Does not cause significant weight loss

Mortality

J Am Coll Cardiol. 2014;64(5):472-481

- Running at even at a slow pace for 5-10 minutes just 1 or 2 times per week decreases cardiovascular mortality by 45%
- Doing it every day reduces cardiovascular mortality by 50%
- Reduced all cause mortality by 29%

Do the commercial programs work? Or just cost a lot of money?

Ann Intern Med. 2005 Jan 4;142(1):56-66.

Systematic review: an evaluation of major commercial weight loss programs in the United States.

Tsai AG[1], Wadden TA.

Author information

Abstract

BACKGROUND: Each year millions of Americans enroll in commercial and self-help weight loss programs. Health care providers and their obese patients know little about these programs because of the absence of systematic reviews.

PURPOSE: To describe the components, costs, and efficacy of the major commercial and organized self-help weight loss programs in the United States that provide structured in-person or online counseling.

DATA SOURCES: Review of company Web sites, telephone discussion with company representatives, and search of the MEDLINE database.

STUDY SELECTION: Randomized trials at least 12 weeks in duration that enrolled only adults and assessed interventions as they are usually provided to the public, or case series that met these criteria, stated the number of enrollees, and included a follow-up evaluation that lasted 1 year or longer.

DATA EXTRACTION: Data were extracted on study design, attrition, weight loss, duration of follow-up, and maintenance of weight loss.

DATA SYNTHESIS: We found studies of eDiets.com, Health Management Resources, Take Off Pounds Sensibly, OPTIFAST, and Weight Watchers. Of 3 randomized, controlled trials of Weight Watchers, the largest reported a loss of 3.2% of initial weight at 2 years. One randomized trial and several case series of medically supervised very-low-calorie diet programs found that patients who completed treatment lost approximately 15% to 25% of initial weight. These programs were associated with high costs, high attrition rates, and a high probability of regaining 50% or more of lost weight in 1 to 2 years. Commercial interventions available over the Internet and organized self-help programs produced minimal weight loss.

LIMITATIONS: Because many studies did not control for high attrition rates, the reported results are probably a best-case scenario.

CONCLUSIONS: With the exception of 1 trial of Weight Watchers, the evidence to support the use of the major commercial and self-help weight loss programs is suboptimal. Controlled trials are needed to assess the efficacy and cost-effectiveness of these interventions.

Comment in

There is insufficient evidence about the efficacy of commercial weight loss programmes. Commentary. [Evid Based Cardiovasc Med. 2005]
Commercial weight loss programs. [Ann Intern Med. 2005]
Review: little evidence supports the efficacy of major commercial and organised self help weight loss programmes. [Evid Based Nurs. 2005]
Review: little evidence supports the efficacy of major commercial and organized self-help weight loss programs. [ACP J Club. 2005]

Summary for patients in

Ann Intern Med. 2005 Jan 4;142(1):I42.

PMID: 15630109 [PubMed - indexed for MEDLINE]

Do dietary supplements work?

South Med J. 2014 Jul;107(7):410-5. doi: 10.14423/SMJ.0000000000000130.

Comparison of traditional and nontraditional weight loss methods: an analysis of the national health and nutrition examination survey.

Post RE, Johnson SP, Wright RU, Mainous AG 3rd.

Author information

Abstract

OBJECTIVES: To evaluate the real-world use of various weight loss techniques and to compare the effectiveness of nontraditional methods with diet and exercise in helping nongeriatric adults lose weight.

METHODS: A cross-sectional analysis of the 2005-2010 National Health and Nutrition Examination Survey was performed. Adult, nonpregnant participants aged 20 to 65 years with a body mass index of ≥ 18.5 who tried to lose weight in the previous year were analyzed (weighted n = 53,570,979). Outcome measures included the proportion of patients who used nontraditional weight loss methods and a comparison of weight loss between those who used diet and exercise and those who used nontraditional methods.

RESULTS: During the previous year, 56.9% (95% confidence interval 54.5-59.4) of participants used nontraditional methods (nonexclusive of diet and exercise) as their attempted weight loss methods. Overall, individuals gained a mean (standard error) of 4.9 (0.3) lb in the 12 months preceding the National Health and Nutrition Examination Survey questionnaire. Only 19.6% (95% confidence interval 18.0-21.2) of the sample lost weight within the previous 12 months. Those who used nontraditional methods gained more weight during the previous year than those who used diet and exercise only (for body mass index ≥ 18.5, 5.5 vs 3.5 lb; $P < 0.01$) in the overall sample, but there was no difference in the obese subgroup.

CONCLUSIONS: Physicians need to reaffirm that diet and exercise are better methods for weight loss, and they need to advise their patients to avoid other methods when attempting to lose weight because they do not enhance weight loss attempts.

Comment in

Commentary on "comparison of traditional and nontraditional weight loss methods: an analysis of the national health and nutrition examination survey". [South Med J. 2014]

PMID: 25010580 [PubMed - indexed for MEDLINE]

So is it just a matter of calories in vs calories out?

CICO?

You are what you eat!

Do you exercise?

Weight Loss

- 97% can be achieved with diet alone.
- Exercise is good for cardiovascular health, but not necessary for weight loss

Don’t say “diet **AND** exercise”

What kind of Exercise?

Treadmill

- Assuming you weigh 200 pounds, if you walk or jog for 3 miles you will burn about 300 calories. That's not much! That's one plain bagel with cheese from Panera.

Weights

- A 200 pound person doing squats for 2 minutes straight, non-stop burns 320 calories. That's only 2 minutes of resistance training! Even if you aren't putting up any weight, just your body weight. Two minutes, 320 calories. Better to do two minutes of squats than run for 3 miles if you just want to burn calories.

Exercise

- Weights and resistance training is much more effective than running on a treadmill (increases BMR)
- Explosive runs/sprints
- Especially true for women and people with low metabolism

LIFT WEIGHTS TO BURN CALORIES!

Weight Training vs Cardio

- Anyone can weight lift, not everyone can run or swim
- Increases BMR
- Improves strength
- Improves mobility
- Improves quality of life
- Improves body composition
- Improves functionality

THE KEY TO LOSING FAT IS LIFTING WEIGHTS!

DIET/CARDIO ONLY

BODY FAT LEVELS: ↓

MUSCLE MASS: ↓

DIET & WEIGHTS

BODY FAT LEVELS: ↓

MUSCLE MASS: ↑ –

WEIGHT LOSS vs FAT LOSS

150 pounds
35% body fat

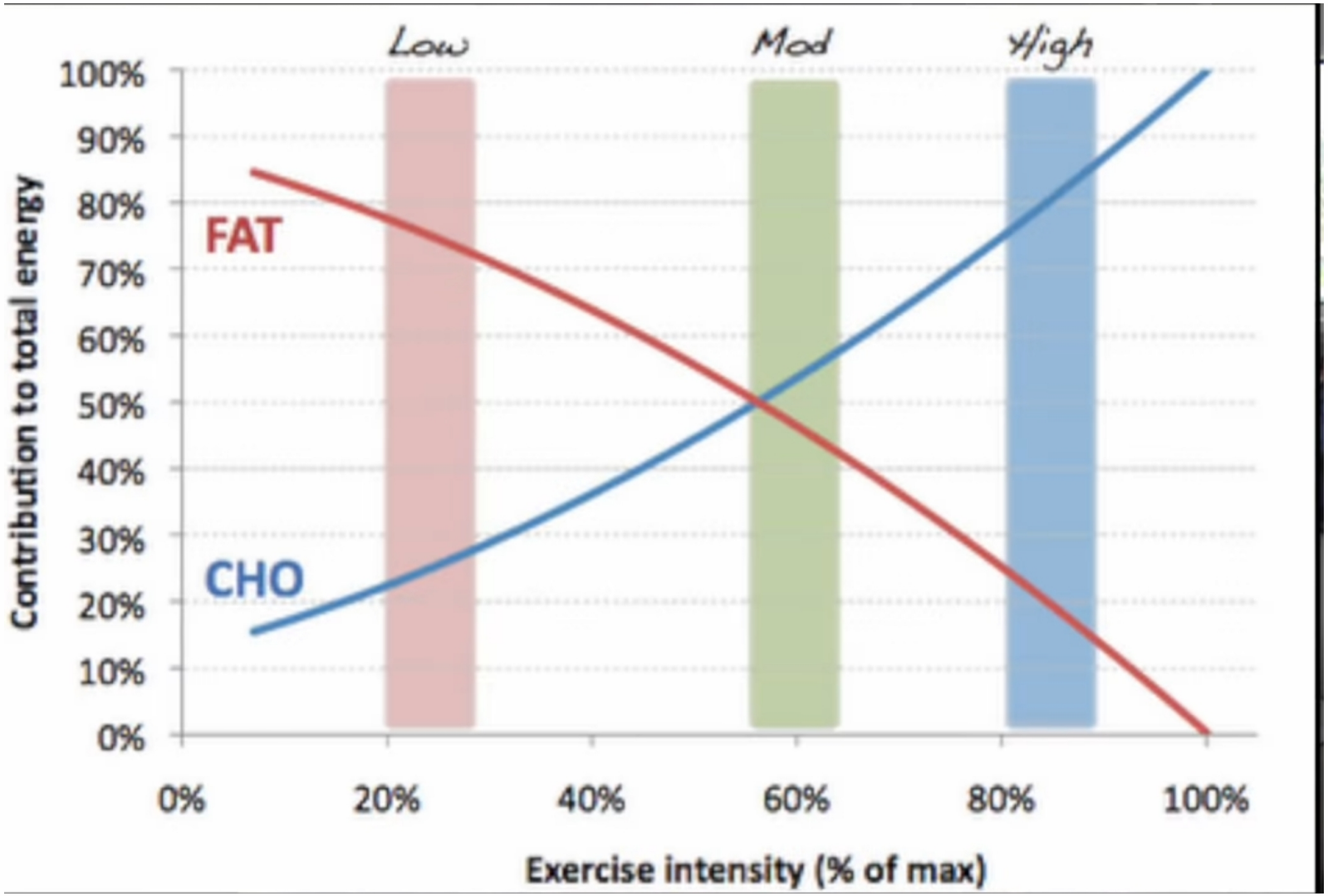
150 pounds
20% body fat

WEIGHT LOSS

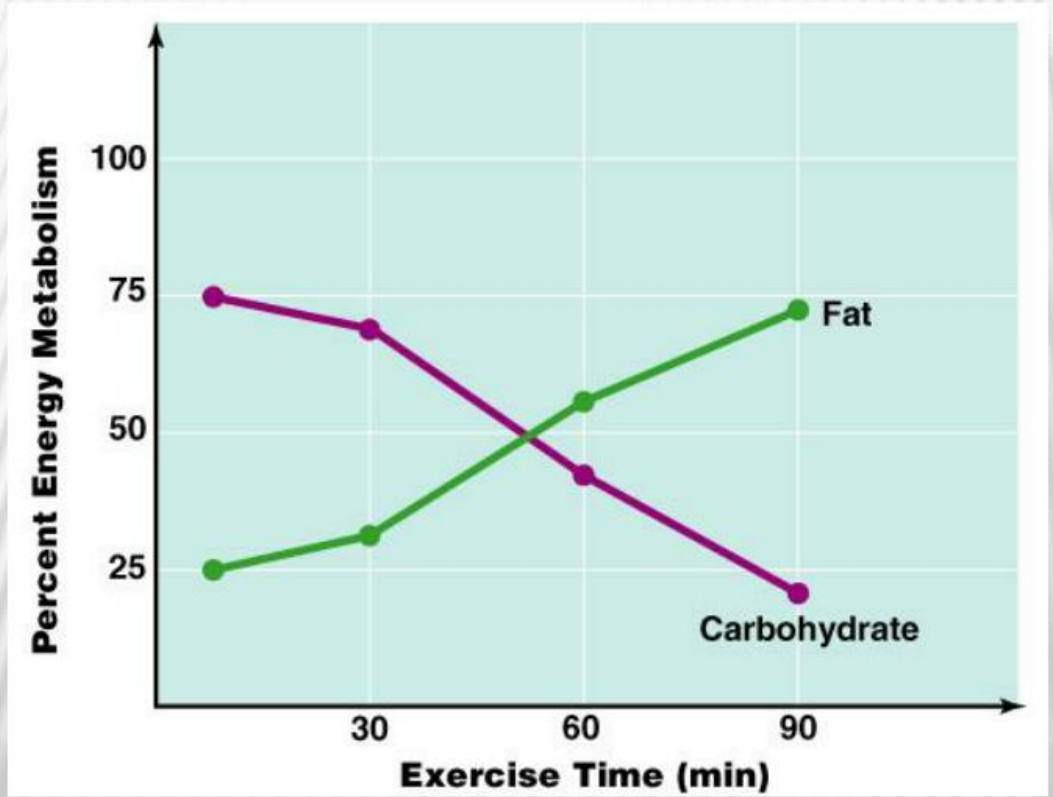
FAT LOSS

Exercise Prescription

- Include cardio and resistance training
- Start at appropriate intensity
- Start with more cardio in beginning
- Transition to more resistance over time
- Weights increase over time
- Adapt over time


Low
Mod
High
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Contribution to total energy
FAT
CHO
0%
20%
40%
60%
80%
100%
Exercise intensity (% of max)

CHANGES IN CARBOHYDRATE and FAT UTILIZATION DURING 90 MINUTES of AEROBIC EXERCISE.



So is it just a matter of calories in vs calories out?

CICO?

No, it's just CALORIES IN!

The out part needs to be taken out!

Ann Nutr Metab. 2007;51(5):428-32. Epub 2007 Nov 20.

Fat loss depends on energy deficit only, independently of the method for weight loss.

Strasser B[1], Spreitzer A, Haber P.

Author information

Abstract

BACKGROUND: This study was designed to compare the effects of 2 different but isocaloric fat reduction programs with the same amount of energy deficit - diet alone or diet combined with aerobic training - on body composition, lipid profile and cardiorespiratory fitness in non- or moderately obese women.

METHODS: Twenty non- or moderately obese (BMI 24.32 +/- 3.11) females (27.3 +/- 6.6 years) were tested at the beginning and after an 8-week period of a mild hypocaloric diet for the following parameters: (1) body mass and body fat; (2) total cholesterol, HDL-C, LDL-C and triglycerides; (3) lactate (millimol/liter) during submaximal exertion (100 W); (4) heart rate during submaximal exertion (100 W), and (5) maximum exercise performance (watt). Subjects were randomly divided into either a diet alone (D, -2,095 +/- 659 kJ/day) or a diet (-1,420 +/- 1,084 kJ/day) plus exercise (DE, three 60-min sessions per week at 60% of VO(2)max or -5,866 kJ/week) group.

RESULTS: Body mass and body fat decreased significantly in D (-1.95 +/- 1.13 kg or -1.47 +/- 0.87%; $p < 0.05$) and DE (-2.23 +/- 1.28 kg or -1.59 +/- 0.87%; $p < 0.05$), but there was no significant difference observed between the groups. Statistical analysis revealed no significant changes of total cholesterol, HDL-C, LDL-C, triglycerides and heart rate during submaximal exertion (100 W). Lactic acid accumulation during submaximal exertion (100 W) decreased significantly (-0.8 +/- 1.4 mmol/l, $p < 0.05$) in DE and increased significantly (+0.4 +/- 0.5 mmol/l, $p < 0.05$) in D. Maximum exercise performance improved significantly (+12.2 +/- 8.8 W, $p < 0.05$) in DE and did not change significantly in D.

CONCLUSIONS: This study showed that independently of the method for weight loss, the negative energy balance alone is responsible for weight reduction.

More Muscle

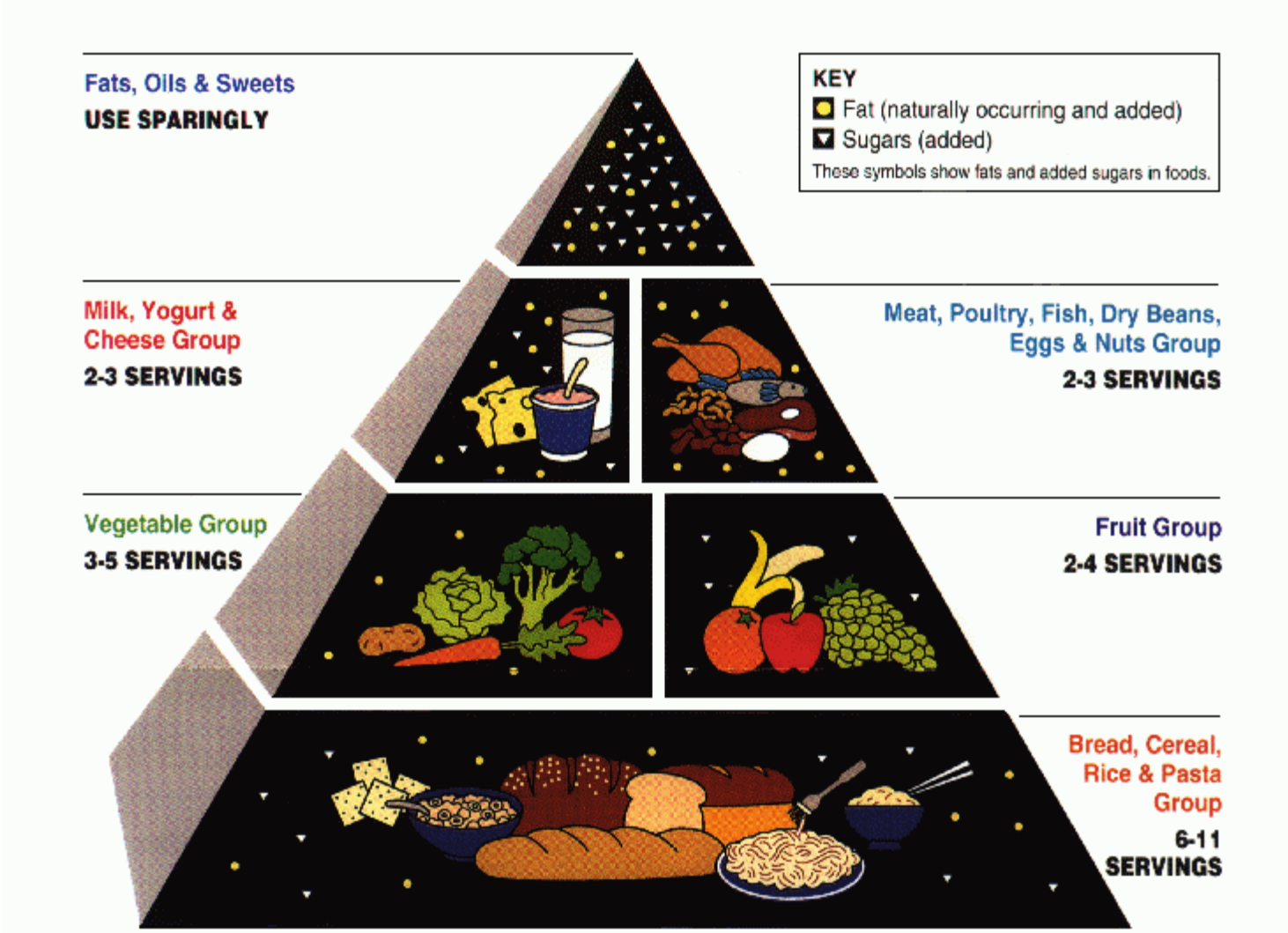
- Protects against cardiovascular mortality
- Protects against cancer
- Protects against chronic illness

Let’s Talk DIET!

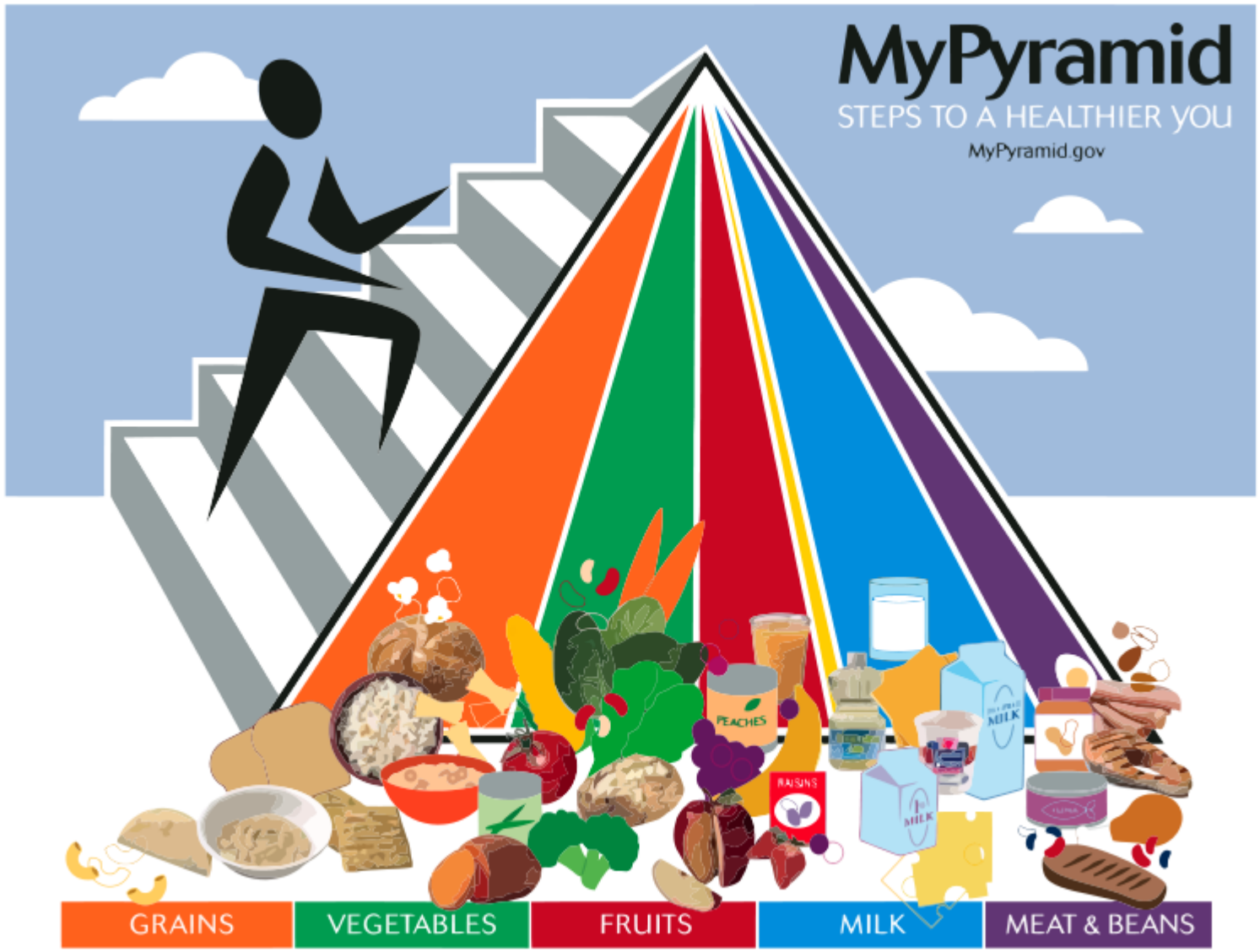
1943


For Health...eat some food from each group...every day!
GROUP ONE
GREEN AND YELLOW VEGETABLES...
some raw—some cooked, frozen or canned
GROUP TWO
ORANGES, TOMATOES, GRAPEFRUIT...
or raw cabbage or salad greens
GROUP THREE
POTATOES AND OTHER VEGETABLES AND FRUITS
raw, dried, cooked, frozen or canned
GROUP FOUR
MILK AND MILK PRODUCTS...
fluid, evaporated, dried milk, or cheese
GROUP FIVE
MEAT, POULTRY, FISH, OR EGGS...
or dried beans, peas, nuts, or peanut butter
GROUP SIX
BREAD, FLOUR, AND CEREALS...
Natural whole grain— or enriched or restored
GROUP SEVEN
BUTTER AND FORTIFIED MARGARINE
(with added Vitamin A)
U.S. NEEDS US STRONG
EAT THE BASIC 7 EVERY DAY
U.S. GOVERNMENT CHART
IN ADDITION TO THE BASIC 7... EAT ANY OTHER FOODS YOU WANT
U.S. DEPARTMENT OF AGRICULTURE

1992


Fats, Oils & Sweets
USE SPARINGLY
KEY
Fat (naturally occurring and added)
Sugars (added)
These symbols show fats and added sugars in foods.
Milk, Yogurt & Cheese Group
2-3 SERVINGS
Meat, Poultry, Fish, Dry Beans, Eggs & Nuts Group
2-3 SERVINGS
Vegetable Group
3-5 SERVINGS
Fruit Group
2-4 SERVINGS
Bread, Cereal, Rice & Pasta Group
6-11 SERVINGS

2005


MyPyramid
STEPS TO A HEALTHIER YOU
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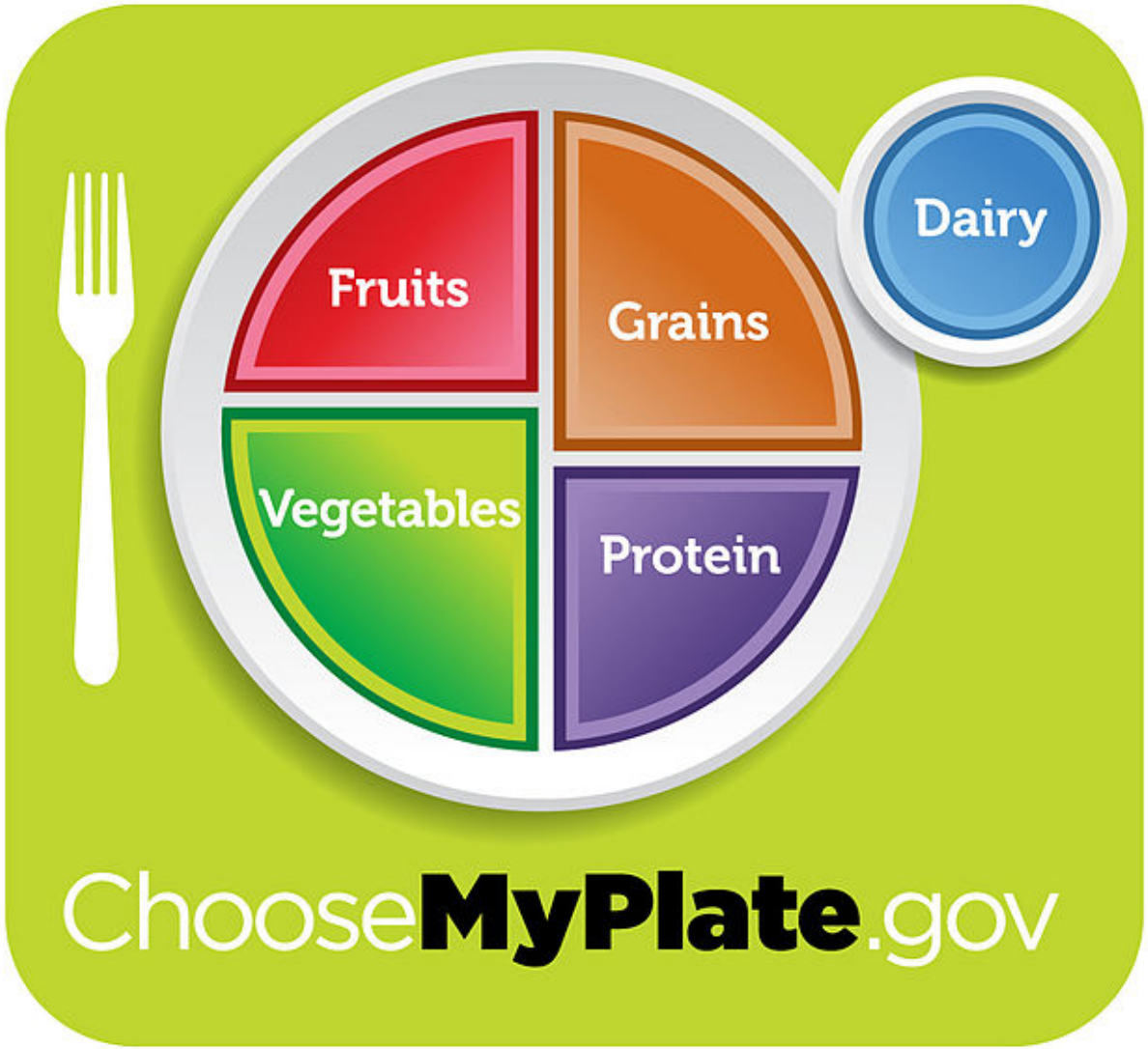
PEACHES
RAISINS
MILK
GRAINS
VEGETABLES
FRUITS
MILK
MEAT & BEANS

2010


Fruits
Grains
Dairy
Vegetables
Protein
ChooseMyPlate.gov

Previous Diets

- Portion control- Weight Watchers, Zone
- Prepared food- Nutrisystem, Jenny Craig
- Low Carb/High protein- Atkins, South Beach, Keto
- Liquid/Fad diets
- Mediterranean- most proven
- Raw- Paleo, Halleluiah, God, Caveman
- Glycemic Index Diet
- Intermittent fasting
- Elimination diets (TB12, Whole30)

All Diets Work (for some time)!

N Engl J Med. Author manuscript; available in PMC 2009 Oct 19.
Published in final edited form as:
N Engl J Med. 2009 Feb 26; 360(9): 859–873.
doi: 10.1056/NEJMoa0804748
PMCID: PMC2763382
NIHMSID: NIHMS138139
PMID: 19246357

Comparison of Weight-Loss Diets with Different Compositions of Fat, Protein, and Carbohydrates

Frank M. Sacks, M.D.,[1,2] George A. Bray, M.D.,[5] Vincent J. Carey, Ph.D.,[2] Steven R. Smith, M.D.,[5] Donna H. Ryan, M.D.,[5] Stephen D. Anton, Ph.D.,[5] Katherine McManus, M.S., R.D.,[4] Catherine M. Champagne, Ph.D.,[5] Louise M. Bishop, M.S., R.D.,[1] Nancy Laranjo, B.A.,[2] Meryl S. Leboff, M.D.,[3] Jennifer C. Rood, Ph.D.,[5] Lilian de Jonge, Ph.D.,[5] Frank L. Greenway, M.D.,[5] Catherine M. Loria, Ph.D.,[6] Eva Obarzanek, Ph.D.,[6] and Donald A. Williamson, Ph.D.[5]
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The publisher's final edited version of this article is available at N Engl J Med
See other articles in PMC that cite the published article.

Associated Data
Supplementary Materials

Abstract

BACKGROUND
The possible advantage for weight loss of a diet that emphasizes protein, fat, or carbohydrates has not been established, and there are few studies that extend beyond 1 year.

METHODS
We randomly assigned 811 overweight adults to one of four diets; the targeted percentages of energy derived from fat, protein, and carbohydrates in the four diets were 20, 15, and 65%; 20, 25, and 55%; 40, 15, and 45%; and 40, 25, and 35%. The diets consisted of similar foods and met guidelines for cardiovascular health. The participants were offered group and individual instructional sessions for 2 years. The primary outcome was the change in body weight after 2 years in two-by-two factorial comparisons of low fat versus high fat and average protein versus high protein and in the comparison of highest and lowest carbohydrate content.

RESULTS
At 6 months, participants assigned to each diet had lost an average of 6 kg, which represented 7% of their initial weight; they began to regain weight after 12 months. By 2 years, weight loss remained similar in those who were assigned to a diet with 15% protein and those assigned to a diet with 25% protein (3.0 and 3.6 kg, respectively); in those assigned to a diet with 20% fat and those assigned to a diet with 40% fat (3.3 kg for both groups); and in those assigned to a diet with 65% carbohydrates and those assigned to a diet with 35% carbohydrates (2.9 and 3.4 kg, respectively) (P>0.20 for all comparisons). Among the 80% of participants who completed the trial, the average weight loss was 4 kg; 14 to 15% of the participants had a reduction of at least 10% of their initial body weight. Satiety, hunger, satisfaction with the diet, and attendance at group sessions were similar for all diets; attendance was strongly associated with weight loss (0.2 kg per session attended). The diets improved lipid-related risk factors and fasting insulin levels.

CONCLUSIONS
Reduced-calorie diets result in clinically meaningful weight loss regardless of which macronutrients they emphasize.

Diets vs. Combinations of Fat, Protein, and Carbohydrates

Roush, Karen MSN, RN, FNP-BC

AJN, American Journal of Nursing: November 2009 - Volume 109 - Issue 11 - p 64
doi: 10.1097/01.NAJ.0000363356.61507.fc

Abstract

The specific composition of macronutrients (fat, protein, or carbohydrate) in diets isn't important for cardiovascular risk reduction, as long as the diet is effective in causing weight loss.

Nurses counseling patients on weight loss should help to design a reduced-energy diet that meets personal preferences. Engaging patients in a weight-loss support group may enhance the effectiveness of the diet.

No difference in body weight decrease between a low-glycemic-index and a high-glycemic-index diet but reduced LDL cholesterol after 10-wk ad libitum intake of the low-glycemic-index diet

Birgitte Sloth [1], Inger Krog-Mikkelsen, Anne Flint, Inge Tetens, Inger Björck, Sophie Vinoy, Helena Elmståhl, Arne Astrup, Vincent Lang, Anne Raben
Affiliations
•PMID: 15277154
•DOI: 10.1093/ajcn/80.2.337

Abstract

Background: The role of glycemic index (GI) in appetite and body-weight regulation is still not clear.
Objective: The objective of the study was to investigate the long-term effects of a low-fat, high-carbohydrate diet with either low glycemic index (LGI) or high glycemic index (HGI) on ad libitum energy intake, body weight, and composition, as well as on risk factors for type 2 diabetes and ischemic heart disease in overweight healthy subjects.

Design: The study was a 10-wk parallel, randomized, intervention trial with 2 matched groups. The LGI or HGI test foods, given as replacements for the subjects' usual carbohydrate-rich foods, were equal in total energy, energy density, dietary fiber, and macronutrient composition. Subjects were 45 (LGI diet: n = 23; HGI diet: n = 22) healthy overweight [body mass index (in kg/m(2)): 27.6 +/- 0.2] women aged 20-40 y.

Results: Energy intake, mean (+/- SEM) body weight (LGI diet: -1.9 +/- 0.5 kg; HGI diet: -1.3 +/- 0.3 kg), and fat mass (LGI diet: -1.0 +/- 0.4 kg; HGI diet: -0.4 +/- 0.3 kg) decreased over time, but the differences between groups were not significant. No significant differences were observed between groups in fasting serum insulin, homeostasis model assessment for relative insulin resistance, homeostasis model assessment for beta cell function, triacylglycerol, nonesterified fatty acids, or HDL cholesterol. However, a 10% decrease in LDL cholesterol ($P < 0.05$) and a tendency to a larger decrease in total cholesterol ($P = 0.06$) were observed with consumption of the LGI diet as compared with the HGI diet.

Conclusions: This study does not support the contention that low-fat LGI diets are more beneficial than HGI diets with regard to appetite or body-weight regulation as evaluated over 10 wk. However, it confirms previous findings of a beneficial effect of LGI diets on risk factors for ischemic heart disease.

How Named Diets Work for Weight Loss

Diet Name	Short Description	How it Works
Low Carb	Eat fewer carbs and more foods rich in protein and fats	**By creating a caloric deficit**
Ketogenic	Eat almost no carbs, some protein and mostly fats	**By creating a caloric deficit**
Low Fat	Avoid foods high in fats and eat mostly protein and carbs	**By creating a caloric deficit**
Intermittent Fasting	Restrict your eating period to only a few hours every day	**By creating a caloric deficit**
Weight Watchers	Points based system to help with portion control	**By creating a caloric deficit**
Paleo	Eat only minimally-processed "paleolithic" foods	**By creating a caloric deficit**

Glycemic Index

- High: white sugar, white bread, beer, baked potato, sugary drinks, pasta, rice
- Low: non-starchy vegetables; broccoli, asparagus, spinach, celery, parsley, lettuce, kale, apples, strawberries, blueberries, oranges, cucumbers
- Medium: multigrain, pita, and rye bread, brown and wild rice, certain fruits

No effect of a diet with a reduced glycaemic index on satiety, energy intake and body weight in overweight and obese women

L M Aston [1], C S Stokes, S A Jebb
Affiliations
•PMID: 17923862
•PMCID: PMC2699494
•DOI: 10.1038/sj.ijo.0803717
Free PMC article

Abstract

Objective: To investigate whether a diet with a reduced glycaemic index (GI) has effects on appetite, energy intake, body weight and composition in overweight and obese female subjects.

Design: Randomized crossover intervention study including two consecutive 12-week periods. Lower or higher GI versions of key carbohydrate-rich foods (breads, breakfast cereals, rice and pasta/potatoes) were provided to subjects to be incorporated into habitual diets in ad libitum quantities. Foods intended as equivalents to each other were balanced in macronutrient composition, fibre content and energy density.
Subjects: Nineteen overweight and obese women, weight-stable, with moderate hyperinsulinaemia (age: 34-65 years, body mass index: 25-47 kg m(-2), fasting insulin: 49-156 pmol l(-1)).

Measurements: Dietary intake, body weight and composition after each 12-week intervention. Subjectively rated appetite and short-term ad libitum energy intake at a snack and lunch meal following fixed lower and higher GI test breakfasts (GI 52 vs 64) in a laboratory setting.

Results: Free-living diets differed in GI by 8.4 units (55.5 vs 63.9), with key foods providing 48% of carbohydrate intake during both periods. There were no differences in energy intake, body weight or body composition between treatments. On laboratory investigation days, there were no differences in subjective ratings of hunger or fullness, or in energy intake at the snack or lunch meal.

Conclusion: This study provides no evidence to support an effect of a reduced GI diet on satiety, energy intake or body weight in overweight/obese women. Claims that the GI of the diet per se may have specific effects on body weight may therefore be misleading.

Healthiest Diet?

BMC Med. 2014 Jul 24;12:112. doi: 10.1186/1741-7015-12-112.

Definitions and potential health benefits of the Mediterranean diet: views from experts around the world.

Trichopoulou A[1], Martínez-González MA, Tong TY, Forouhi NG, Khandelwal S, Prabhakaran D, Mozaffarian D, de Lorgeril M.

Author information

Abstract

The Mediterranean diet has been linked to a number of health benefits, including reduced mortality risk and lower incidence of cardiovascular disease. Definitions of the Mediterranean diet vary across some settings, and scores are increasingly being employed to define Mediterranean diet adherence in epidemiological studies. Some components of the Mediterranean diet overlap with other healthy dietary patterns, whereas other aspects are unique to the Mediterranean diet. In this forum article, we asked clinicians and researchers with an interest in the effect of diet on health to describe what constitutes a Mediterranean diet in different geographical settings, and how we can study the health benefits of this dietary pattern.

Curr Atheroscler Rep. 2013 Dec;15(12):370. doi: 10.1007/s11883-013-0370-4.

Mediterranean diet and cardiovascular disease: historical perspective and latest evidence.

de Lorgeril M.

Author information

Abstract

The concept that the Mediterranean diet was associated with a lower incidence of cardiovascular disease (CVD) was first proposed in the 1950s. Since then, there have been randomized controlled trials and large epidemiological studies that reported associations with lower CVD: in 1994 and 1999, the reports of the intermediate and final analyses of the trial Lyon Diet Heart Study; in 2003, a major epidemiological study in Greece showing a strong inverse association between a Mediterranean score and the risk of cardiovascular complications; in 2011-2012, several reports showing that even non-Mediterranean populations can gain benefits from long-term adhesion to the Mediterranean diet; and in 2013, the PREDIMED trial showing a significant risk reduction in a low-risk population. Contrary to the pharmacological approach of cardiovascular prevention, the adoption of the Mediterranean diet has been associated with a significant reduction in new cancers and overall mortality. Thus, in terms of evidence-based medicine, the full adoption of a modern version of the Mediterranean diet pattern can be considered one of the most effective approaches for the prevention of fatal and nonfatal CVD complications.

PMID: 24105622 [PubMed - indexed for MEDLINE]

See 1 citation found by title matching your search:

Did you mean: *randomized trial comparing **low fat low carbohydrate diet** matched for energy and protein* (1 items)

Obes Res. 2004 Nov;12 Suppl 2:130S-40S.

A randomized trial comparing low-fat and low-carbohydrate diets matched for energy and protein.

Segal-Isaacson CJ[1], Johnson S, Tomuta V, Cowell B, Stein DT.

Author information

Abstract

Several recent studies have found greater weight loss at 6 months among participants on a very-low-carbohydrate (VLC) weight-loss diet compared with a low-fat (LF) weight-loss diet. Because most of these studies were not matched for calories, it is not clear whether these results are caused by decreased energy intake or increased energy expenditure. It is hypothesized that several energy-consuming metabolic pathways are up-regulated during a VLC diet, leading to increased energy expenditure. The focus of this study was to investigate whether, when protein and energy are held constant, there is a significant difference in fat and weight loss when fat and carbohydrate are dramatically varied in the diet. The preliminary results presented in this paper are for the first four of six postmenopausal overweight or obese participants who followed, in random order, both a VLC and an LF diet for 6 weeks. Other outcome measures were serum lipids, glucose, and insulin, as well as dietary compliance and side effects. Our results showed no significant weight loss, lipid, serum insulin, or glucose differences between the two diets. Lipids were dramatically reduced on both diets, with a trend for greater triglyceride reduction on the VLC diet. Glucose levels were also reduced on both diets, with a trend for insulin reduction on the VLC diet. Compliance was excellent with both diets, and side effects were mild, although participants reported more food cravings and bad breath on the VLC diet and more burping and flatulence on the LF diet.

PMID: 15601961 DOI: 10.1038/oby.2004.278

[Indexed for MEDLINE] **Free full text**

Cardiovascular Risk

Changes in weight loss, body composition and cardiovascular disease risk after altering macronutrient distributions during a regular exercise program in obese women

Chad M Kerksick, Jennifer Wismann-Bunn, Donovan Fogt, Ashli R Thomas, Lem Taylor, Bill I Campbell, Colin D Wilborn, Travis Harvey, Mike D Roberts, Paul La Bounty, Melyn Galbreath, Brandon Marcello, Christopher J Rasmussen & Richard B Kreider

Background

This study's purpose investigated the impact of different macronutrient distributions and varying caloric intakes along with regular exercise for metabolic and physiological changes related to weight loss.

Methods

One hundred forty-one sedentary, obese women (38.7 ± 8.0 yrs, 163.3 ± 6.9 cm, 93.2 ± 16.5 kg, 35.0 ± 6.2 kg•m^{-2}, 44.8 ± 4.2% fat) were randomized to either no diet + no exercise control group (CON) a no diet + exercise control (ND), or one of four diet + exercise groups (high-energy diet [HED], very low carbohydrate, high protein diet [VLCHP], low carbohydrate, moderate protein diet [LCMP] and high carbohydrate, low protein [HCLP]) in addition to beginning a 3x•week^{-1} supervised resistance training program. After 0, 1, 10 and 14 weeks, all participants completed testing sessions which included anthropometric, body composition, energy expenditure, fasting blood samples, aerobic and muscular fitness assessments. Data were analyzed using repeated measures ANOVA with an alpha of 0.05 with LSD post-hoc analysis when appropriate.

Results

All dieting groups exhibited adequate compliance to their prescribed diet regimen as energy and macronutrient amounts and distributions were close to prescribed amounts. Those groups that followed a diet and exercise program reported significantly greater anthropometric (waist circumference and body mass) and body composition via DXA (fat mass and % fat) changes. Caloric restriction initially reduced energy expenditure, but successfully returned to baseline values after 10 weeks of dieting and exercising. Significant fitness improvements (aerobic capacity and maximal strength) occurred in all exercising groups. No significant changes occurred in lipid panel constituents, but serum insulin and HOMA-IR values decreased in the VLCHP group. Significant reductions in serum leptin occurred in all caloric restriction + exercise groups after 14 weeks, which were unchanged in other non-diet/non-exercise groups.

Conclusions

Overall and over the entire test period, all diet groups which restricted their caloric intake and exercised experienced similar responses to each other. Regular exercise and modest caloric restriction successfully promoted anthropometric and body composition improvements along with various markers of muscular fitness. Significant increases in relative energy expenditure and reductions in circulating leptin were found in response to all exercise and diet groups. Macronutrient distribution may impact circulating levels of insulin and overall ability to improve strength levels in obese women who follow regular exercise.

Regardless of what macronutrient breakdown you use, if you are losing weight, all of your cardiovascular risk factors improve

Cardiovascular Risk

2017 Jul;36(5):378-385.
doi: 10.1080/07315724.2017.1318317. Epub 2017 Jun 19.

Dietary Red and Processed Meat Intake and Markers of Adiposity and Inflammation: The Multiethnic Cohort Study

Weiwen Chai [1], Yukiko Morimoto [2], Robert V Cooney [3], Adrian A Franke [2], Yurii B Shvetsov [2], Loïc Le Marchand [2], Christopher A Haiman [4], Laurence N Kolonel [2], Marc T Goodman [5], Gertraud Maskarinec [2]
Affiliations
•PMID: 28628401
•PMCID: PMC5540319
•DOI: 10.1080/07315724.2017.1318317

Abstract

Objective: The potential influence of dietary factors on inflammation is important for cancer prevention. Utilizing data from control participants (312 men, 911 women) in 2 nested case-control studies of cancer within the Multiethnic Cohort, we examined the associations of red and processed meat intake with serum levels of leptin, adiponectin, C-reactive protein (CRP), tumor necrosis factor (TNF)-α, and interleukin (IL)-6 and the mediator effect of body mass index (BMI) on the above associations (if present).

Methods: Multivariable linear models were applied to assess the association between red and processed meat intake at cohort entry and serum biomarker levels measured 9.1 years later after adjusting for covariates and to determine the mediator effect of BMI.

Results: Overall red and processed meat intake was positively associated with serum leptin levels in men ($\beta = 0.180$, $p = 0.0004$) and women ($\beta = 0.167$, $p < 0.0001$). In women, higher red and processed meat consumption was significantly associated with higher CRP ($\beta = 0.069$, $p = 0.03$) and lower adiponectin levels ($\beta = -0.082$, $p = 0.005$). In mediation analyses with red and processed meat intake and BMI as predictors, the associations of red and processed meat with biomarkers decreased substantially (as indicated by percentage change in effect: leptin in men, 13.4%; leptin in women, 13.7%; adiponectin in women, -4.7%; CRP in women, 7.4%) and were no longer significant ($p > 0.05$), whereas BMI remained significantly associated with serum leptin (men: $\beta = 3.209$, $p < 0.0001$; women: $\beta = 2.891$, $p < 0.0001$), adiponectin (women: $\beta = -1.085$, $p < 0.0001$), and CRP (women: $\beta = 1.581$, $p < 0.0001$).

Conclusion: The current data suggest that the amount of excess body weight or the degree of adiposity may mediate the relations between dietary red and processed meat intake and serum biomarkers associated with obesity and inflammation.

If you are overweight, the amount of red meat and saturated fat will affect cardiovascular risk.

Effects of Total Red Meat Intake on Glycemic Control and Inflammatory Biomarkers: A Meta-Analysis of Randomized Controlled Trials

Lauren E O'Connor [1,2], Jung Eun Kim [2,3], Caroline M Clark [2], Wenbin Zhu [4], Wayne W Campbell [2]

•PMID: 32910818
• DOI: 10.1093/advances/nmaa096

Abstract

Our objective was to conduct a systematic review and meta-analysis to assess the effects of total red meat (TRM) intake on glycemic control and inflammatory biomarkers using randomized controlled trials of individuals free from cardiometabolic disease. We hypothesized that higher TRM intake would negatively influence glycemic control and inflammation based on positive correlations between TRM and diabetes. We found 24 eligible articles (median duration, 8 weeks) from 1172 articles searched in PubMed, Cochrane, and CINAHL up to August 2019 that included 1) diet periods differing in TRM; 2) participants aged ≥19 years; 3) included either men or women who were not pregnant/lactating; 4) no diagnosed cardiometabolic disease; and 5) data on fasting glucose, insulin, HOMA-IR, glycated hemoglobin (HbA1c), C-reactive protein (CRP), or cytokines. We used 1) a repeated-measures ANOVA to assess pre to post diet period changes; 2) random-effects meta-analyses to compare pre to post changes between diet periods with ≥ vs. <0.5 servings (35g)/day of TRM; and 3) meta-regressions for dose-response relationships. We grouped diet periods to explore heterogeneity sources, including risk of bias, using the National Heart, Lung, and Blood Institute's Quality Assessment of Controlled Interventions Studies. Glucose, insulin, and HOMA-IR values decreased, while HbA1c and CRP values did not change during TRM or alternative diet periods. There was no difference in change values between diet periods with ≥ vs. <0.5 servings/day of TRM [weighted mean differences (95% CIs): glucose, 0.040 mmol/L (-0.049, 0.129); insulin, -0.710 pmol/L (-6.582, 5.162); HOMA-IR, 0.110 (-0.072, 0.293); CRP, 2.424 nmol/L (-1.460, 6.309)] and no dose response relationships (P > 0.2). Risk of bias (85% of studies were fair to good) did not influence results. Total red meat consumption, for up to 16 weeks, does not affect changes in biomarkers of glycemic control or inflammation for adults free of, but at risk for, cardiometabolic disease. This trial was registered at PROSPERO as 2018 CRD42018096031.

A cohort study examined the relationship between relationship between red meat, BMI and inflammatory markers (CRP, TNF-**α**, and IL-6) in 1223 subjects. They did indeed find that red meat intake was associated with markers of inflammation, HOWEVER, when they corrected for the differences in BMI, the associations between red meat and inflammatory markers were no longer significant, while the associations between BMI and inflammation were.

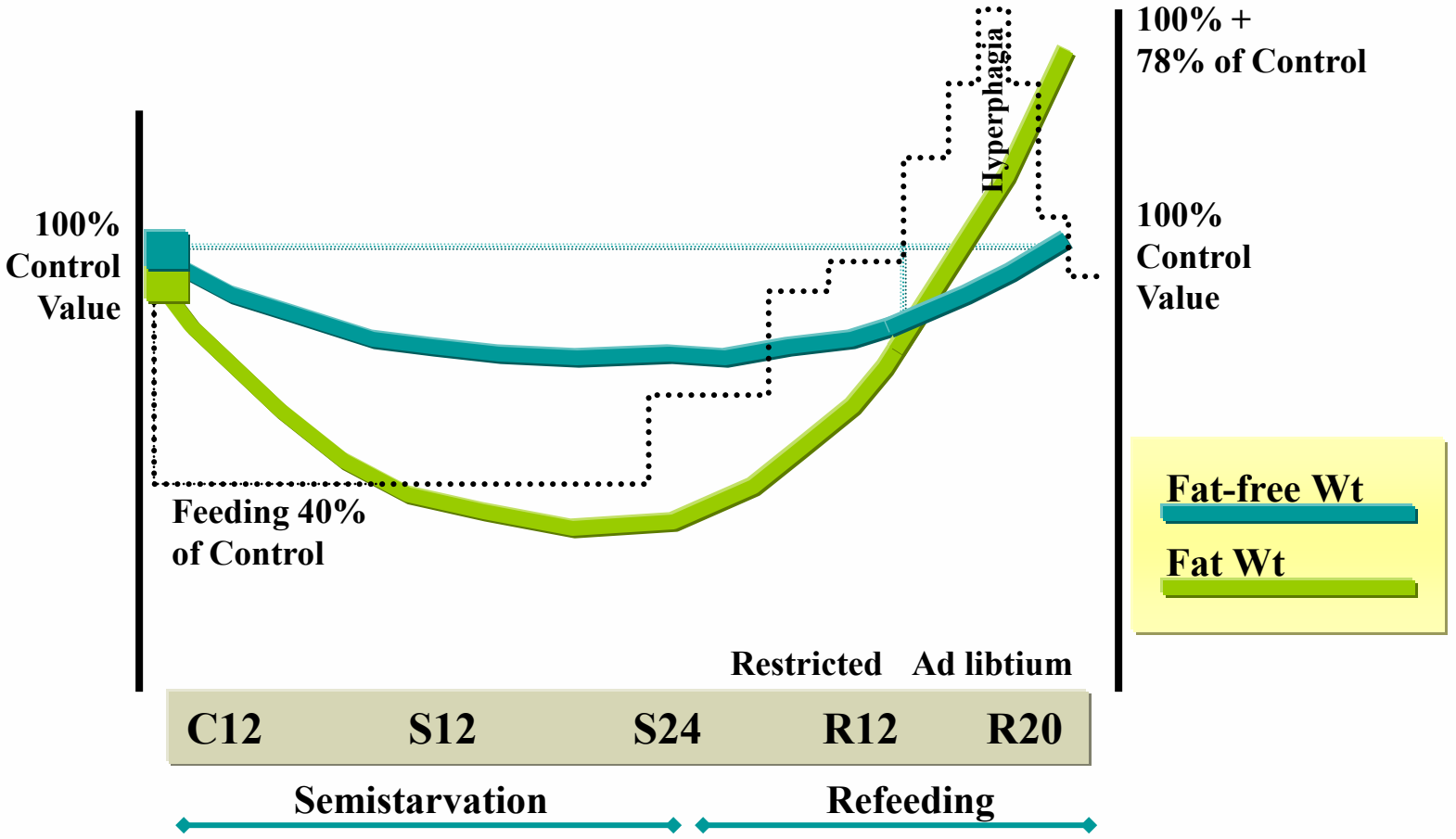
Cardiovascular Risk

Conclusion:

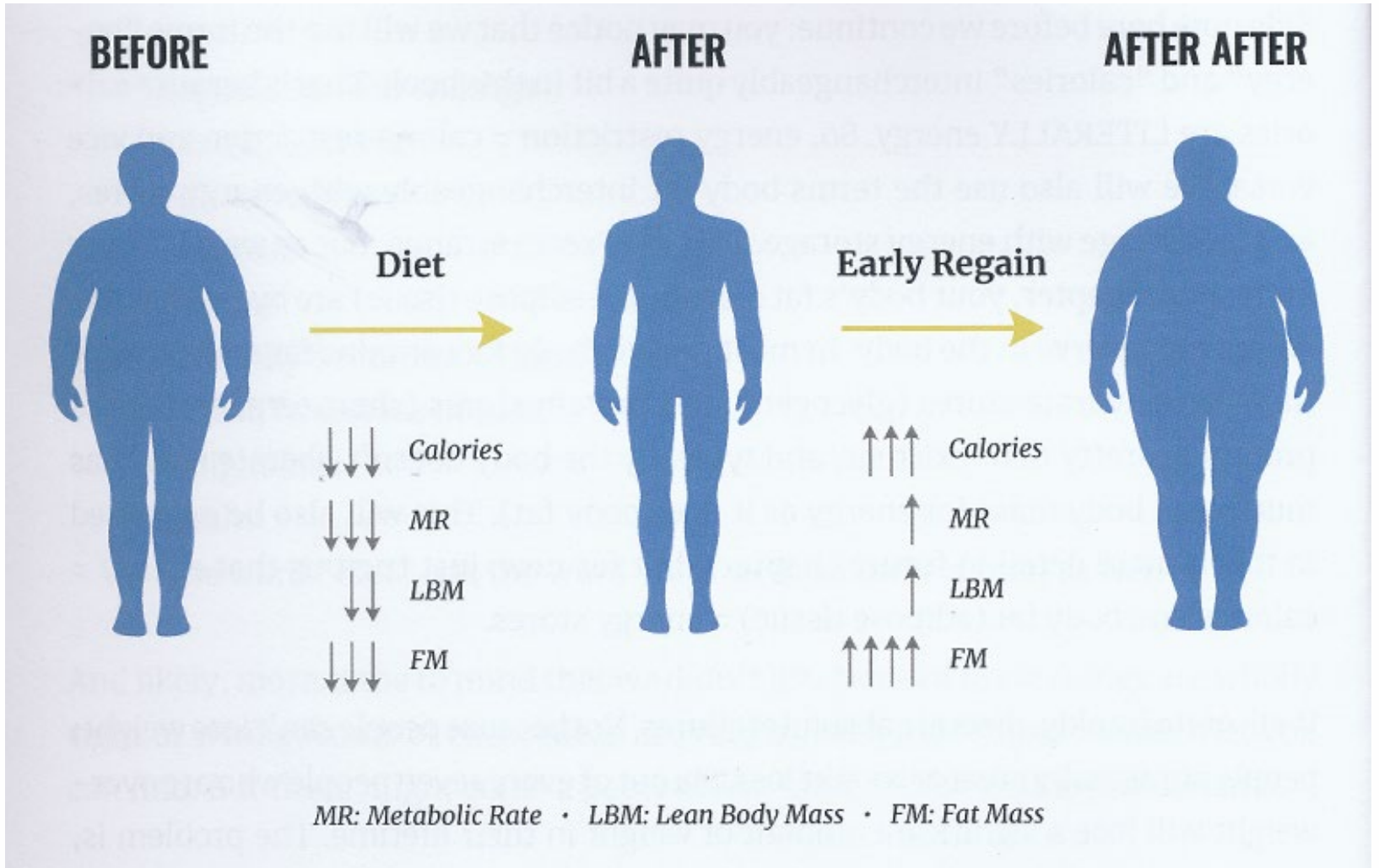
Obesity and elevated BMI increase all inflammatory and CV risk factors

Calorie deficit and weight loss improve all CV risk factors

Yo-yo dieting is horrible



Keys, 1950; Dulloo, AJCN - 1997


BEFORE
AFTER
AFTER AFTER
Diet
Early Regain
Calories
MR
LBM
FM
Calories
MR
LBM
FM
MR: Metabolic Rate • LBM: Lean Body Mass • FM: Fat Mass

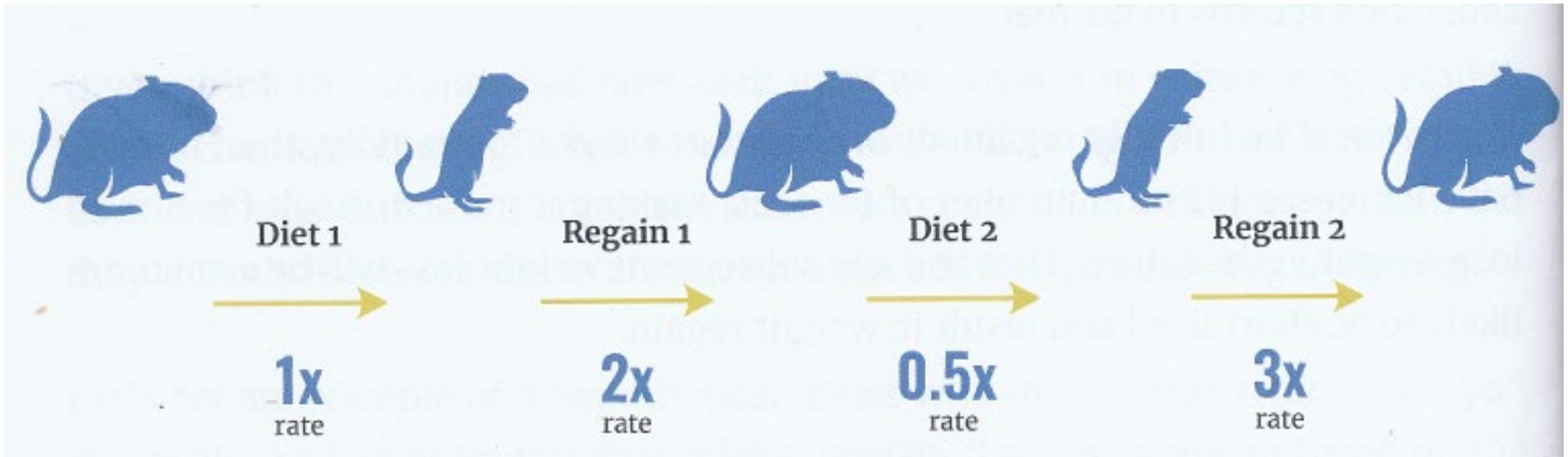
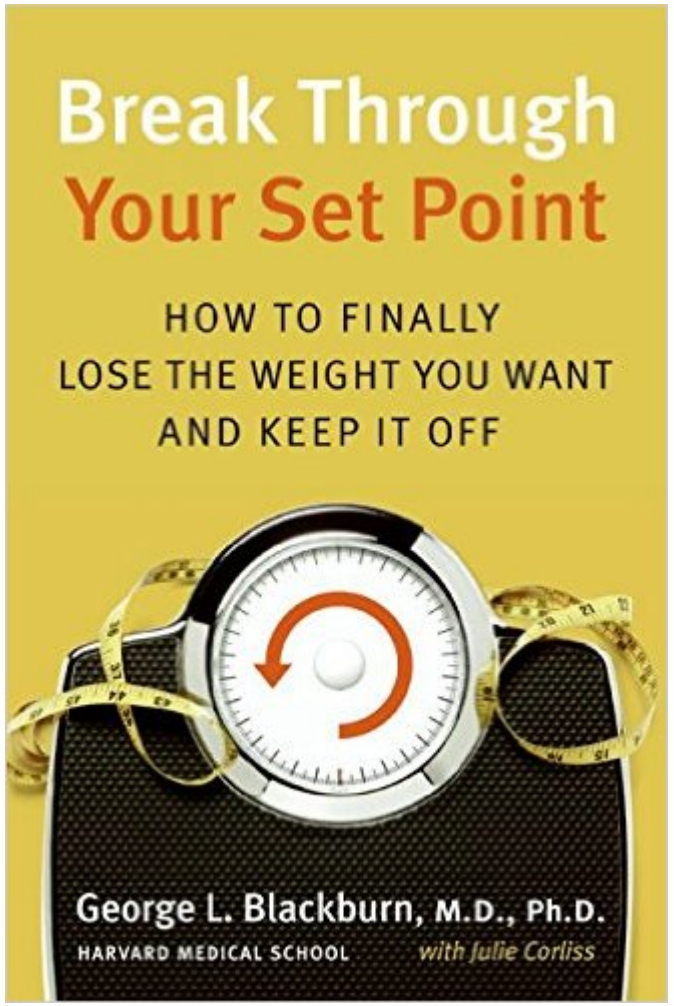


Figure 3: Summary of a yo-yo dieting study performed by Brownell et al. where rats regained weight post

Why Diets Fail

- Calorie counting
- Expensive
- Difficult to follow
- Too extreme
- Unhealthy
- Not good fit for you
- Fighting Against Your Set Point
- Lose interest after plateau and adaptation
- Calories too low


Break Through
Your Set Point
HOW TO FINALLY
LOSE THE WEIGHT YOU WANT
AND KEEP IT OFF
George L. Blackburn, M.D., Ph.D.
HARVARD MEDICAL SCHOOL
with Julie Corliss

Set Point

Dr. George Blackburn – Harvard Physician. Set point. 35 years of research on Weight Loss. Lose 10%, hold steady for 6 months, repeat. Invented original formula for SlimFast Shakes.

Vermont Prison Experiment 1964 – overfeeding and underfeeding prisoners, all went back to original weight when left alone

Minnesota Starvation Study – Dr. Ancel Keys. Difficult to lose a lot of weight over short period of time. Body will rebel and bad outcomes occur.

Normal Weight

- Weight set by age 18
- Gain 1 pound per year from ages 20-50
- Body works hard to protect itself from quick short term weight gain and weight loss
- The reason why it’s hard to lose weight
- Men slightly higher metabolic rate than women

Top Down Weight Loss

People lose weight from the top down and gain it back in opposite order

Fight to Maintain

The biggest battle in weight loss is the fight to keep it off.

Metabolic Adaptation

Metabolic Adaptation

TDEE/RMR/BMR goes down, and can stay down for very long time (years, see Biggest Loser contestants after 6 years)

Genetically programmed self defense mechanism to ward off starvation and enhance weight gain/storage and reduces the chance of future diet success and enhances future weight regain.

Buffer calories of 200-300
Body reduces NEAT

Keys to Fat Loss

- Keep calories as high as possible while still in a deficit
- Slow, maintained weight loss to protect lean mass (the slower the better)
- Don’t lower fat too much (decreases testosterone and other hormones)
- Don’t crash diet
- Calorie deficit
- Keep protein high
- Strength train hard
- Refeeds (results may vary)
- Diet Breaks (longer than refeeds)

https://pubmed.ncbi.nlm.nih.gov/28925405-intermittent-energy-restriction-improves-weight-loss-efficiency-in-obese-men-the-matador-study/?from_single_result=ijo2017206

Intermittent energy restriction improves weight loss efficiency in obese men: the MATADOR study

N M Byrne [1,2], A Sainsbury [3], N A King [2], A P Hills [1,2], R E Wood [1,2]
Affiliations
•PMID: 28925405
•PMCID: PMC5803575
•DOI: 10.1038/ijo.2017.206
Free PMC article

Abstract

Background/objectives: The MATADOR (Minimising Adaptive Thermogenesis And Deactivating Obesity Rebound) study examined whether intermittent energy restriction (ER) improved weight loss efficiency compared with continuous ER and, if so, whether intermittent ER attenuated compensatory responses associated with ER.

Subjects/methods: Fifty-one men with obesity were randomised to 16 weeks of either: (1) continuous (CON), or (2) intermittent (INT) ER completed as 8 × 2-week blocks of ER alternating with 7 × 2-week blocks of energy balance (30 weeks total). Forty-seven participants completed a 4-week baseline phase and commenced the intervention (CON: N=23, 39.4±6.8 years, 111.1±9.1 kg, 34.3±3.0 kg m^{-2}; INT: N=24, 39.8±9.5 years, 110.2±13.8 kg, 34.1±4.0 kg m^{-2}). During ER, energy intake was equivalent to 67% of weight maintenance requirements in both groups. Body weight, fat mass (FM), fat-free mass (FFM) and resting energy expenditure (REE) were measured throughout the study.

Results: For the N=19 CON and N=17 INT who completed the intervention per protocol, weight loss was greater for INT (14.1±5.6 vs 9.1±2.9 kg; P<0.001). INT had greater FM loss (12.3±4.8 vs 8.0±4.2 kg; P<0.01), but FFM loss was similar (INT: 1.8±1.6 vs CON: 1.2±2.5 kg; P=0.4). Mean weight change during the 7 × 2-week INT energy balance blocks was minimal (0.0±0.3 kg). While reduction in absolute REE did not differ between groups (INT: -502±481 vs CON: -624±557 kJ d^{-1}; P=0.5), after adjusting for changes in body composition, it was significantly lower in INT (INT: -360±502 vs CON: -749±498 kJ d^{-1}; P<0.05).

Conclusions: Greater weight and fat loss was achieved with intermittent ER. Interrupting ER with energy balance 'rest periods' may reduce compensatory metabolic responses and, in turn, improve weight loss efficiency.

https://pubmed.ncbi.nlm.nih.gov/28925405/

Key Points

•Despite the same energy deficit and the same total time spent in an energy deficit, a group taking two-week diet breaks after every two weeks of dieting lost ~50% more fat mass compared to a group dieting continuously for 16 weeks. However, due to the frequency of these breaks, the group performing diet breaks required 30 weeks to complete all 16 weeks of dieting.

•Additionally, resting energy expenditure dropped only half as much in the diet break group compared to the continuous diet group when adjusted for body composition. This may be why the difference in groups favored the diet break group to a greater degree after a six-month follow-up, indicating diet breaks may help with the maintenance of weight loss after a diet concludes.

•Diet breaks appear to reverse important physiological adaptations to an energy deficit, subsequently making the dieting period following a break more effective for fat loss. While increasing the time required to complete a diet as much as was done in this study is probably impractical, performing a diet break every 4-8 weeks versus every two weeks may be a useful strategy for physique competitors and weight class-restricted strength athletes to enhance fat loss and mitigate declines in resting energy expenditure

https://pubmed.ncbi.nlm.nih.gov/28925405/

Keeping Weight Off

Sustainability and adherence

1. Cognitive Restraint in some form
2. Self monitoring
3. Regular Exercise (formed good habits)
4. Structured Programs
5. Ability to focus on long term goals

https://pubmed.ncbi.nlm.nih.gov/18268511-dietary-adherence-and-weight-loss-success-among-overweight-women-results-from-the-a-to-z-weight-loss-study/
https://pubmed.ncbi.nlm.nih.gov/16854220-dietary-and-physical-activity-behaviors-among-adults-successful-at-weight-loss-maintenance/?from_single_result=pmc1555605
https://pubmed.ncbi.nlm.nih.gov/22516488-successful-weight-loss-among-obese-us-adults/?from_single_result=pmc3339766
https://pubmed.ncbi.nlm.nih.gov/19587114-regular-exercise-attenuates-the-metabolic-drive-to-regain-weight-after-long-term-weight-loss/?from_single_result=pmc2739786
https://pubmed.ncbi.nlm.nih.gov/21677272-biologys-response-to-dieting-the-impetus-for-weight-regain/?from_single_result=pmc3174765

Plateau

Reduce calories slightly (fat or carbs)
Add in more exercise or activity

Lower carbs and fat by 5-10-15% per day (keep protein the same)
Increase activity 5-10-15% (may not make a difference at all)

*Relative to your current activity level

Life Revolves Around Food

- Our lives shouldn’t revolve around eating
- What are you doing for lunch?
- Let's go out to eat
- Funerals, weddings, parties, birthdays
- Happy, depressed, emotional eating

- Eat to live. Don’t live to eat!

What causes Weight gain?

Hypothalmus & Hormones

- Controls hunger and satiety, homeostasis
- Insulin, leptin, adiponectin, ghrelin
- Ghrelin- hunger hormone. Tells the brain the stomach is empty. Gastric bypass surgery eliminates parts of stomach that secrete this. Traditional dieting, boosts this level. Signals hunger 4 hours after previous meal.
- Incretins in small bowel tell brain to stop eating.
- Leptin- made in adipose tissue. Signals to brain that enough fat has been stored in body to be able to sustain a pregnancy. People without it are gigantic.
- Vagus nerve – stomach stretch response tells brain it's full. Was target of early meds.

Weight Gain Medications

- Diabetes: insulin, thiazolidinediones, and sulfonylureas
- Antipsychotics: haloperidol, clozapine, risperidone, quetiapine, olanzapine, and lithium
- Antidepressant: amitriptyline, imipramine, paroxetine, trazadone, alprazolam, and sertraline
- Epilepsy: valproate, carbamazepine, and gabapentin
- Steroids: prednisone or birth control pills
- Blood pressure: beta-blockers
- Antihistamines: ranitidine, diphenhydramine, cetirizine
- Opioids: oxycodone, hydrocodone

Weight loss Medications

- Metformin, symlin, acarbose, januvia/galvus, byetta, victoza, ACEIs/ARBs, Norvasc, topamax, wellbutrin, chemo, flagyl, amio, hydralazine, theophylline, fluoxetine, adderall, abilify, geodon, sulphasalazine, caffiene, acetazolamide, quinidine, amphotericine B,

Weight Loss Medications

- Xenical
- Adipex
- Qsymia
- Bontril
- Contrave
- Saxenda

To use

- BMI over 30 or
- BMI 27 with 1 risk factor

Xenical

- Alli/Orlistat
- Prevents fat absorption
- SE: Loose stool, diarrhea, oily stool
- Modest Weight loss 4-6 pounds/year

Adipex (phentermine)

- Affects hypothal to release norepi. Also works on other tissues to release epi to break down stored fat. Also releases small amounts of seratonin and dopamine.
- Anorexigenics or anoretics
- Significant pHTN and valvular heart disease when used with fenfluramine and dexafenfluramine
- Tolerance to effect after a few weeks
- 3 months duration (Ohio)
- Amphetamine abuse
- Stimulant side effects
- Withdrawal gives fatigue, sleepy
- Avoid alpha blockers, anti-depressants

Qsymia

- Combo: phentermine and topamax

Topamax: anticonvulsant, migraines

Modified fructose, excreted in urine

SE: Somnolence, depression, fatigue, hairloss, glaucoma, nystagmus, parasthesias

Bontril

- Phendimetrazine tartrate- stimulant, sympathomimetic amine, similar to phentermine
- Magnitude of increased weight loss of drug-treated patients over placebo treated patients is only a fraction of a pound a week
- No valvulopathies

Contraindications:

- Known hypersensitivity or idiosyncratic reactions to sympathomimetics.
- Advanced arteriosclerosis, symptomatic cardiovascular disease, moderate and severe hypertension, hyperthyroidism, and glaucoma.
- Highly nervous or agitated patients.
- Patients with a history of drug abuse.
- Patients taking other CNS stimulants, including monoamine oxidase inhibitors

Contrave

Buproprion/Naltrexone combination

Bup: dopa, norepi reuptake inhib and pure opioid antagonist reduces reward from eating, reduce cravings

Naltrexone blocks the MOP-R and prevents the β-endorphin-mediated feedback autoinhibition of POMC cells. Together, the **naltrexone**/bupropion combination produces a greater increase in POMC activity than either drug alone. This increased POMC activity is suppresses appetite.

Synergistic effect on weight loss

Affects hypothal decreases appetite

11-16 pounds/year (or 5% of starting weight)

Saxenda

- Liraglutide (Victoza) injectable GLP1 agonist, appetite and calorie intake regulation (does not increase energy expenditure)
- Start at lower dose and work up to 3mg
- Cut back other diabetic meds
- Possible risk of pancreatitis, monitor closely
- SE: Mostly GI, mostly Nausea (39%), but only 9% quit study due to nausea
- 5 studies, 3384 patients, diet, counseling and saxenda
- Ozempic (semaglutide) , Rybelsus (semaglutide)

Table 4. Changes in Weight at Week 56 for Studies 1, 2, and 3

	Study 1 (Obesity or overweight with comorbidity)		Study 2 (Type 2 diabetes with obesity or overweight)		Study 3 (Obesity or overweight with comorbidity following at least 5% weight loss with diet)	
	Saxenda N=2487	**Placebo N=1244**	**Saxenda N=423**	**Placebo N=212**	**Saxenda N=212**	**Placebo N=210**
Weight						
Baseline mean (SD) (kg)	106.2 (21.2)	106.2 (21.7)	105.7 (21.9)	106.5 (21.3)	100.4 (20.8)	98.7 (21.2)
Percent change from baseline (LSMean)	-7.4	-3.0	-5.4	-1.7	-4.9	0.3
Difference from placebo (LSMean) (95% CI)	-4.5* (-5.2;-3.8)		-3.7* (-4.7;-2.7)		-5.2* (-6.8;-3.5)	
% of Patients losing greater than or equal to 5% body weight	62.3%	34.4%	49.0%	16.4%	44.2%	21.7%
Difference from placebo (LSMean) (95% CI)	27.9* (23.9;31.9)		32.6* (25.1;40.1)		22.6* (13.9;31.3)	
% of Patients losing greater than 10% body weight	33.9%	15.4%	22.4%	5.5%	25.4%	6.9%
Difference from placebo (LSMean) (95% CI)	18.5* (15.2;21.7)		16.9* (11.7;22.1)		18.5* (11.7;25.3)	

SD = Standard Deviation; CI = Confidence Interval

* $p < 0.0001$ compared to placebo. Type 1 error was controlled across the three endpoints.

Adjunct

- FIRST: DIET, DIET, DIET! (they have to learn how to eat right first)
- Maximize short time on drugs
- Frequent physician visits
- Social support
- Phone apps: MyFitnessPal
- Diet resources
- Daily weigh ins
- Accountability

Goals of a Perfect Diet

- Cheap/Free
- Good for your health
- Easy to follow
- Doesn’t require master's degree
- Sustainable long term
- Doesn’t rely on fads or trends
- No outrageous promises
- Evidence based
- Healthy relationship with food (no good foods or bad foods)

DIET

WEIGHT X 12-14 for maintenance calories

WEIGHT X 10 for deficit

200 X 12-14 = 2400-2800 Calories

200 X 10 = 2000 Calories

0.7-1.2 grams of protein per pound

140-240 grams of protein

The rest can be any combination of carbs and fat!

Calories Out

- Don’t eat back calories that you burn off
- Calories and exercise should be independent
- We really don’t know how much we are burning off and it is usually capped

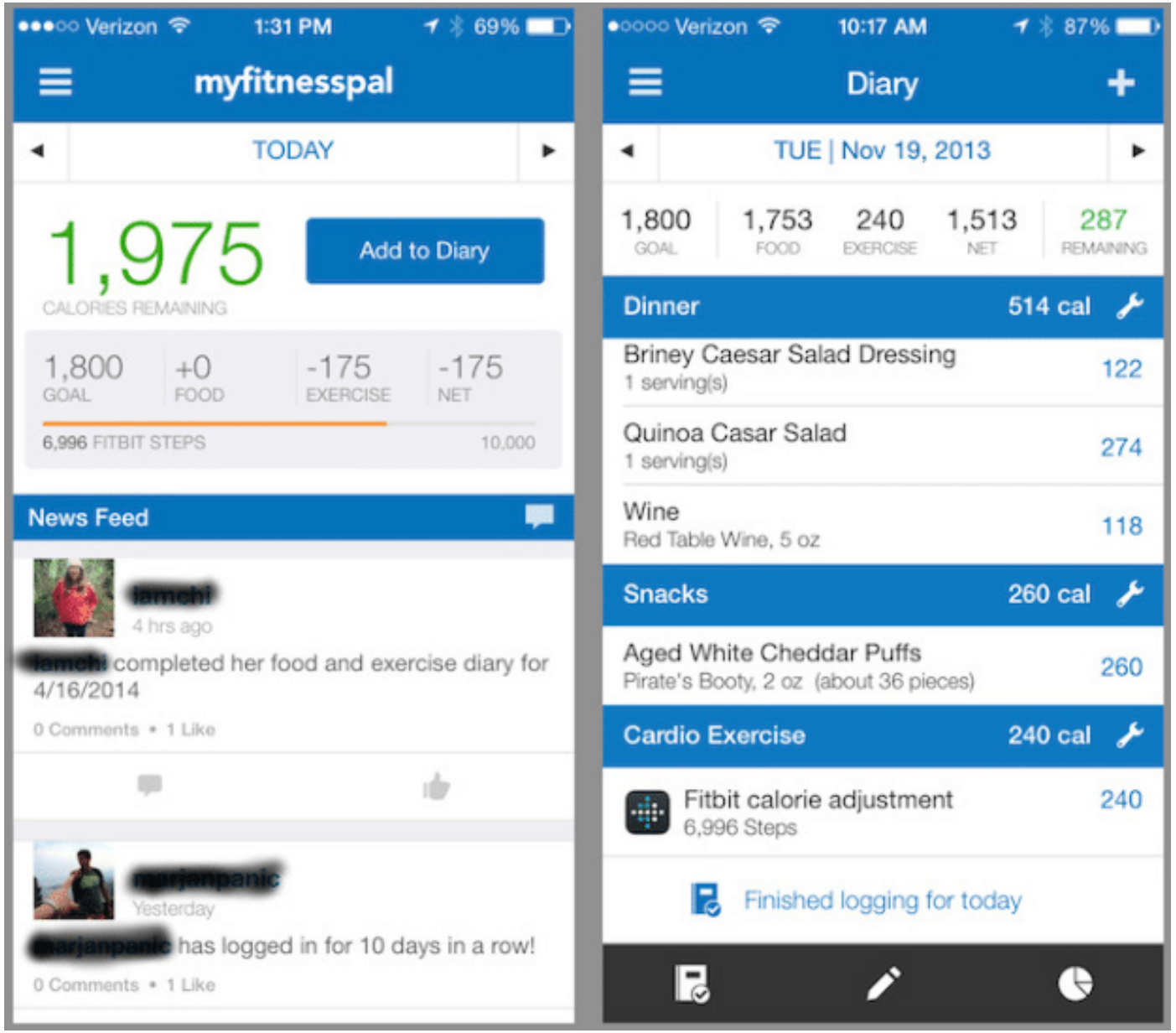
Body Recomposition

Can gain Muscle and Lose fat at the same time in a calorie deficit

- Obese
- New to training
- Deconditioned Lifters
- Anabolic steroids

MyFitnessPal

- Set up account
- Input data (age, sex, weight, height)
- Don’t connect fitness tracker
- Adjust calories to your goal
- Set 40/40/20 (protein, carbs, fat)
- Start tracking for 4 weeks
- Weigh daily
- Adjust up or down


Verizon 1:31 PM 69%
myfitnesspal
TODAY
1,975
CALORIES REMAINING
Add to Diary
1,800 GOAL
+0 FOOD
-175 EXERCISE
-175 NET
6,996 FITBIT STEPS
10,000
News Feed
[redacted]
4 hrs ago
[redacted] completed her food and exercise diary for 4/16/2014
0 Comments • 1 Like
[redacted]
Yesterday
[redacted] has logged in for 10 days in a row!
0 Comments • 1 Like
Verizon 10:17 AM 87%
Diary
TUE | Nov 19, 2013
1,800 GOAL
1,753 FOOD
240 EXERCISE
1,513 NET
287 REMAINING
Dinner 514 cal
Briney Caesar Salad Dressing
1 serving(s) 122
Quinoa Casar Salad
1 serving(s) 274
Wine
Red Table Wine, 5 oz 118
Snacks 260 cal
Aged White Cheddar Puffs
Pirate's Booty, 2 oz (about 36 pieces) 260
Cardio Exercise 240 cal
Fitbit calorie adjustment
6,996 Steps 240
Finished logging for today

Not losing?

Diet after the Diet

New maintenance calories are lower
Lower BMR
Reverse diet (slowly increase calories over time to increase BMR and minimize fat gain)

https://pubmed.ncbi.nlm.nih.gov/21677272-biologys-response-to-dieting-the-impetus-for-weight-regain/?from_single_result=21677272
https://pubmed.ncbi.nlm.nih.gov/15388619-the-runaway-weight-gain-train-too-many-accelerators-not-enough-brakes/?from_single_result=329%2F7468%2F736

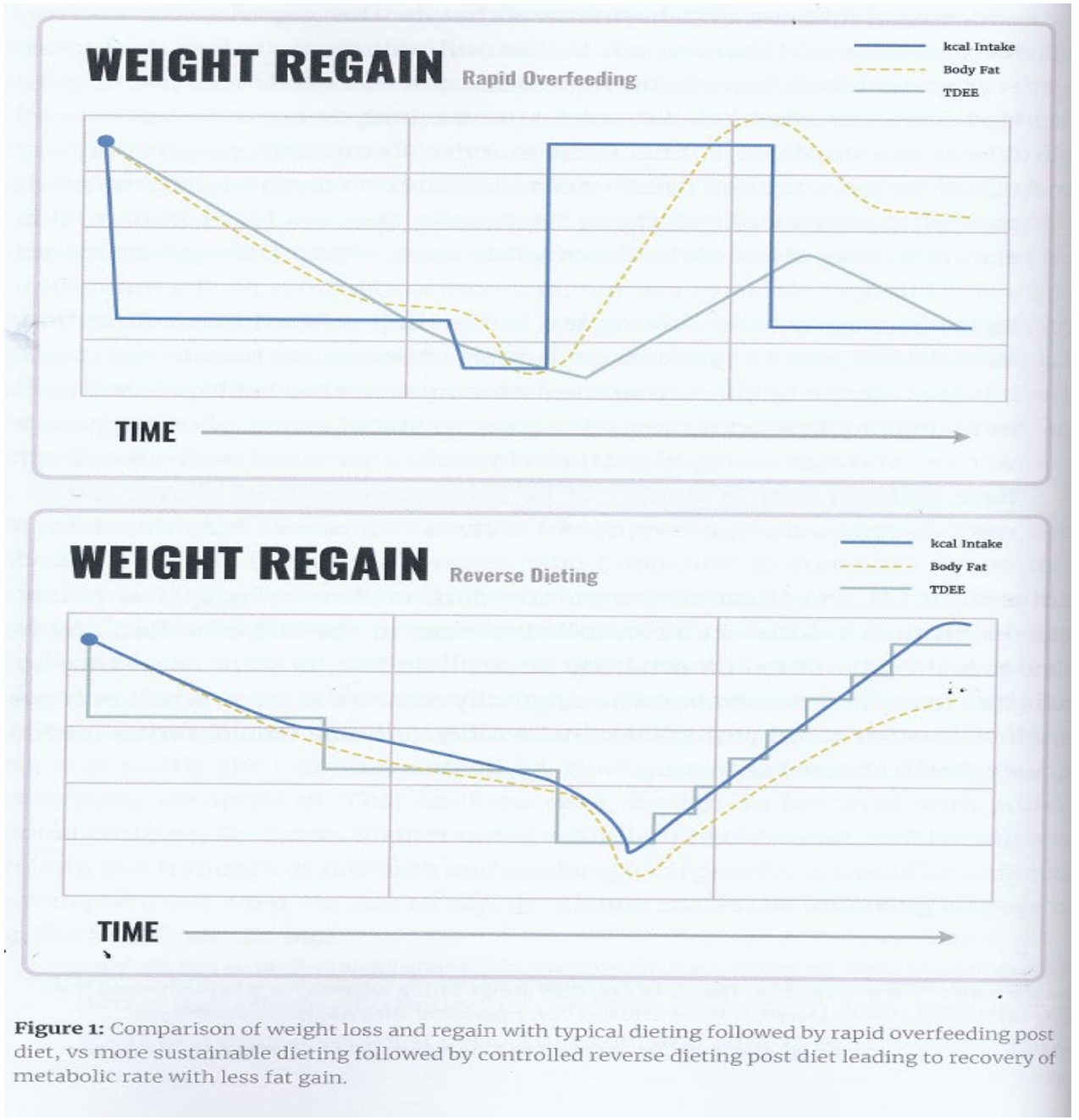


Figure 1: Comparison of weight loss and regain with typical dieting followed by rapid overfeeding post diet, vs more sustainable dieting followed by controlled reverse dieting post diet leading to recovery of metabolic rate with less fat gain.

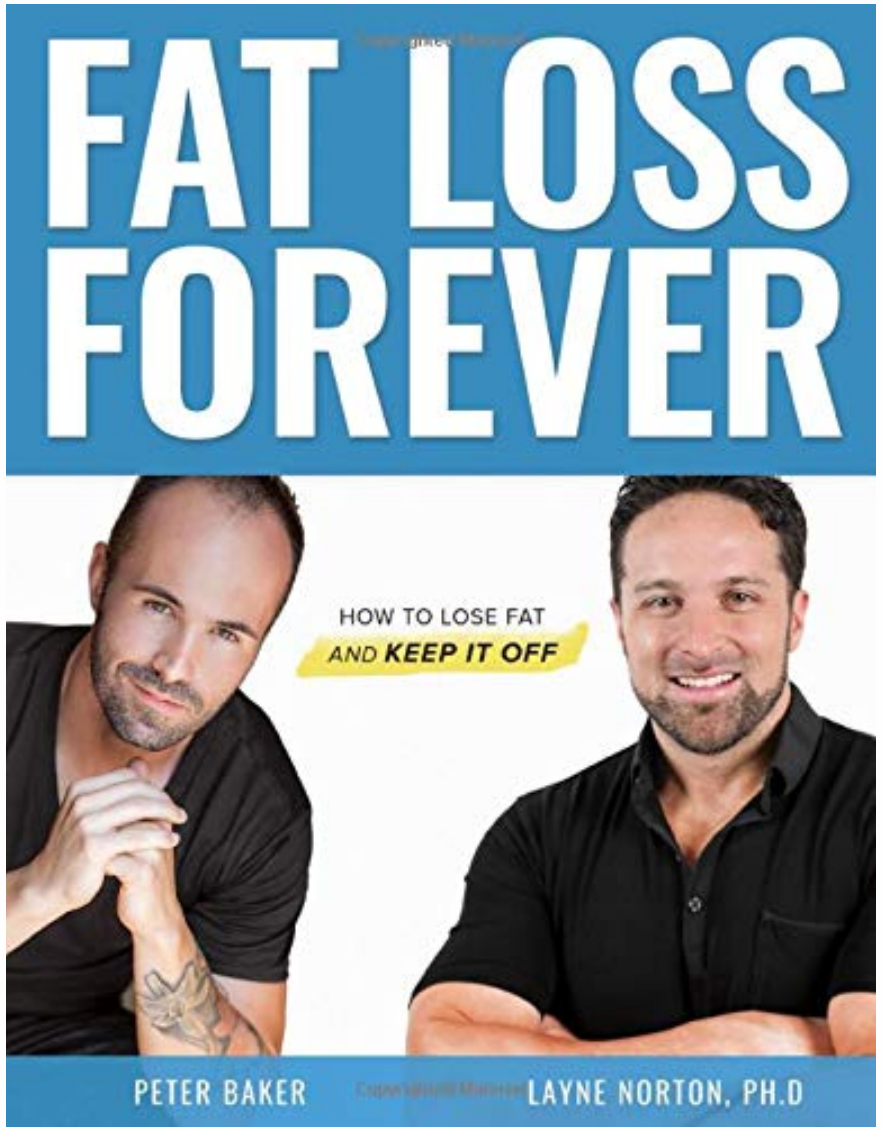
Resources

Macros Inc Calculator

https://macrosinc.net/macro-calculator/

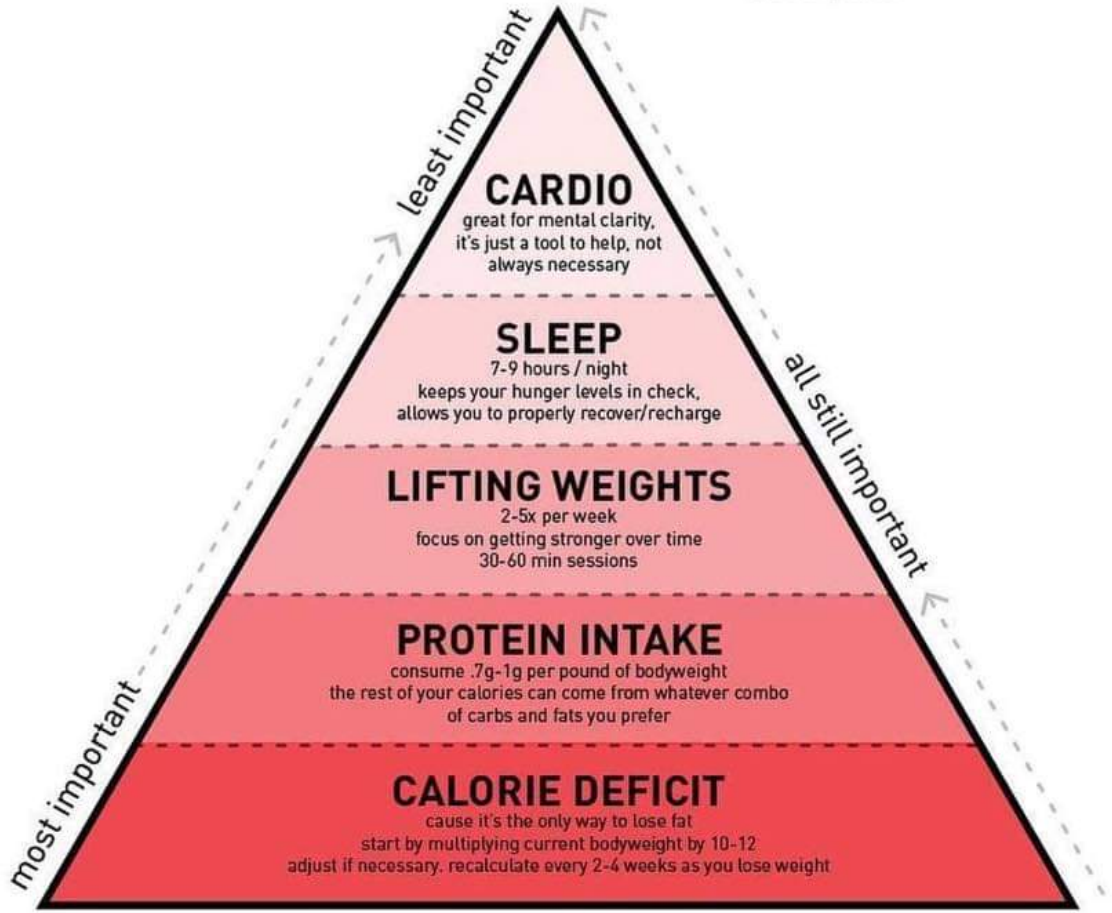
Macros Inc Facebook Page
Great resource of very helpful and supportive people

Dr. Layne Norton



GOLDEN PYRAMID OF FAT LOSS

@saltylifts



Fat Loss Fundamentals

@bdccarpenter

Non-Negotiable

A calorie deficit

Highly Advisable

Making your plan as easy to stick to as possible
Consuming adequate protein
Resistance training
Keeping an active lifestyle
Prioritising nutritious food
Adequate sleep

Shit Most People Don't Need To Worry About

What the "best" diet is
How many meals you eat
Your carb to fat ratio
Calorie cycling
Whether your cardio is fasted or not
What time of the day you eat
What you consume after your workout
What time you train

Stuff people focus on the most

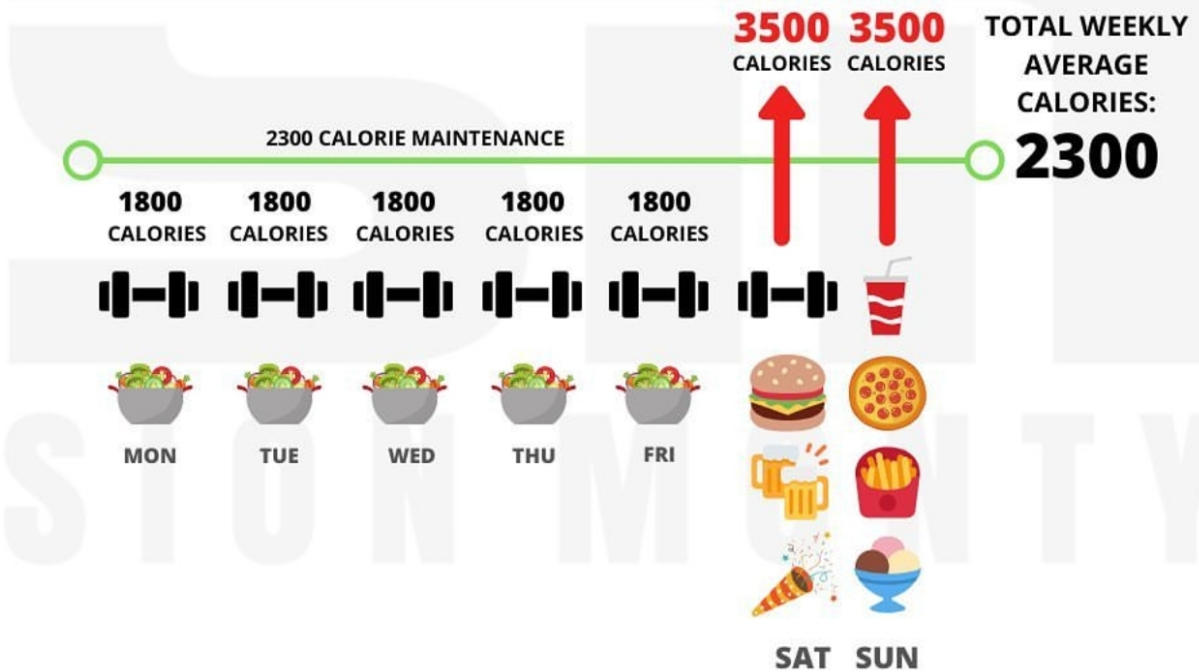
Shit That Can Just Fuck Off

Unnecessary food avoidance
"Cheat meals"
Juice cleanses
Weight loss teabags
Self proclaimed quick fixes
False promises

HOW TO DESTROY

FOLLOW @SIONMONTY

YOUR DIET



DONT ALLOW THE WEEKEND TO GET THE BETTER OF YOU!

SION MONTY

DEFICIT, BALANCE, MODERATION, CONSISTENCY

SION MONTY

THE KEY TO LOSING FAT IS LIFTING WEIGHTS!

DIET/CARDIO ONLY

BODY FAT LEVELS: ↓

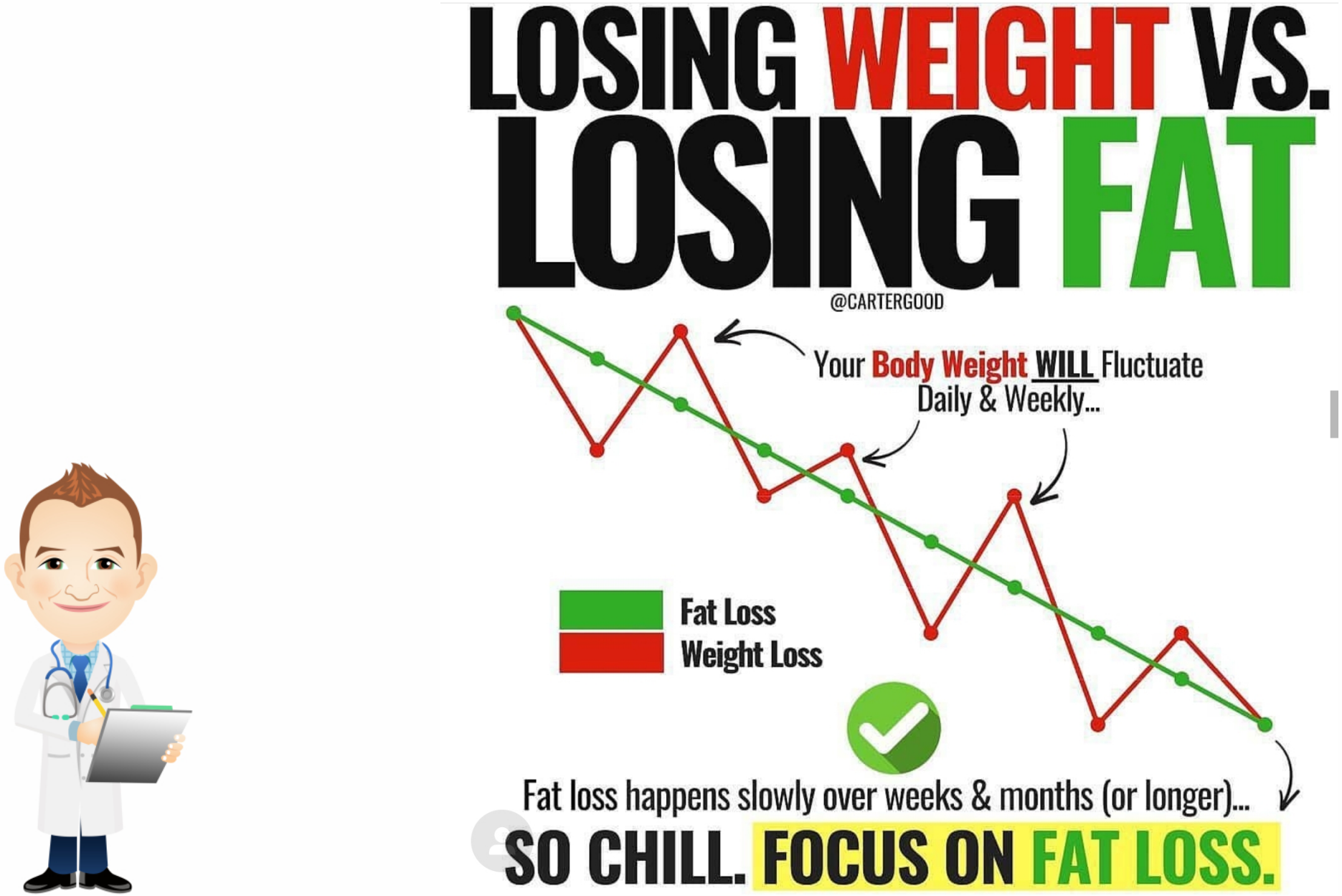
MUSCLE MASS: ↓

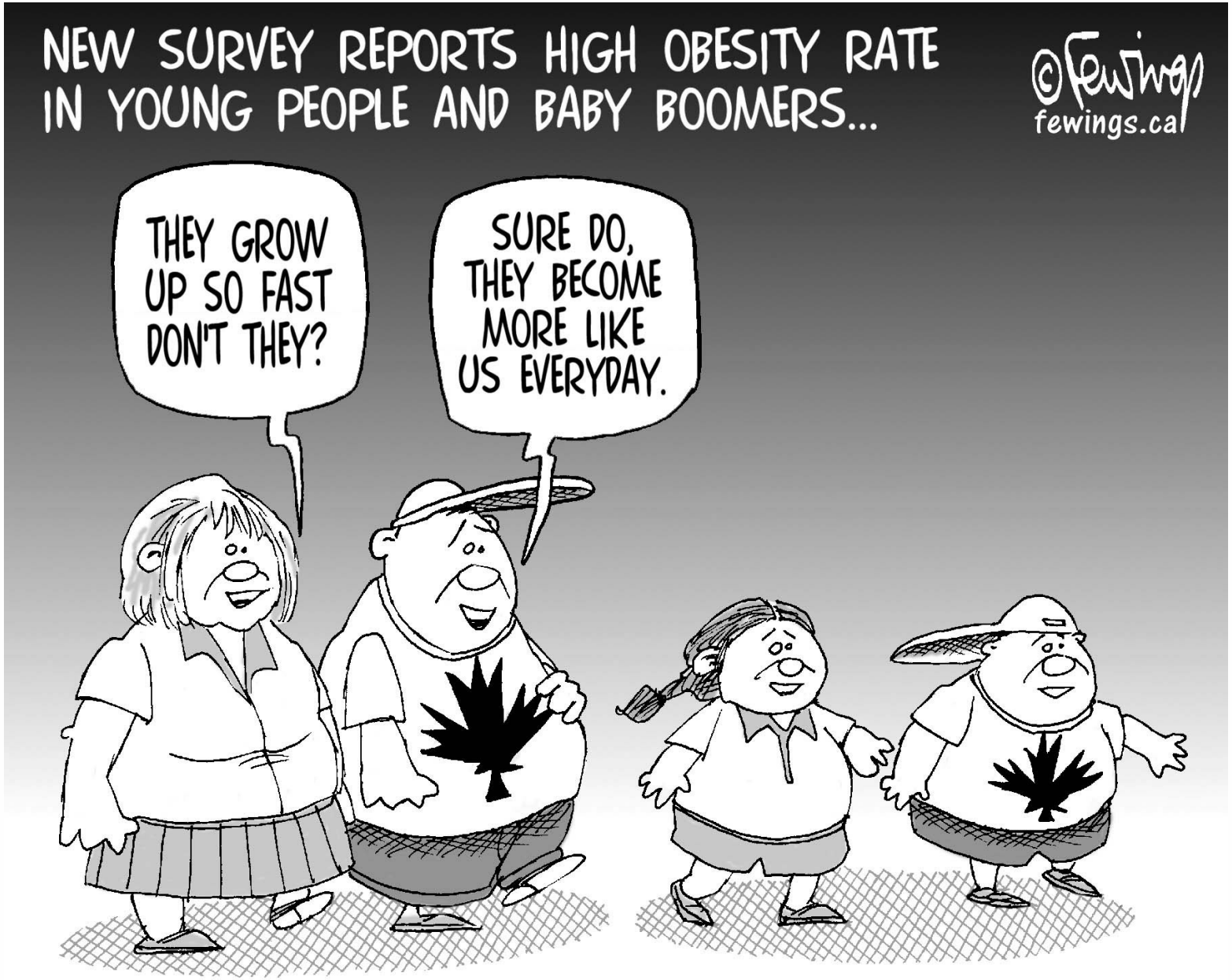
DIET & WEIGHTS

BODY FAT LEVELS: ↓

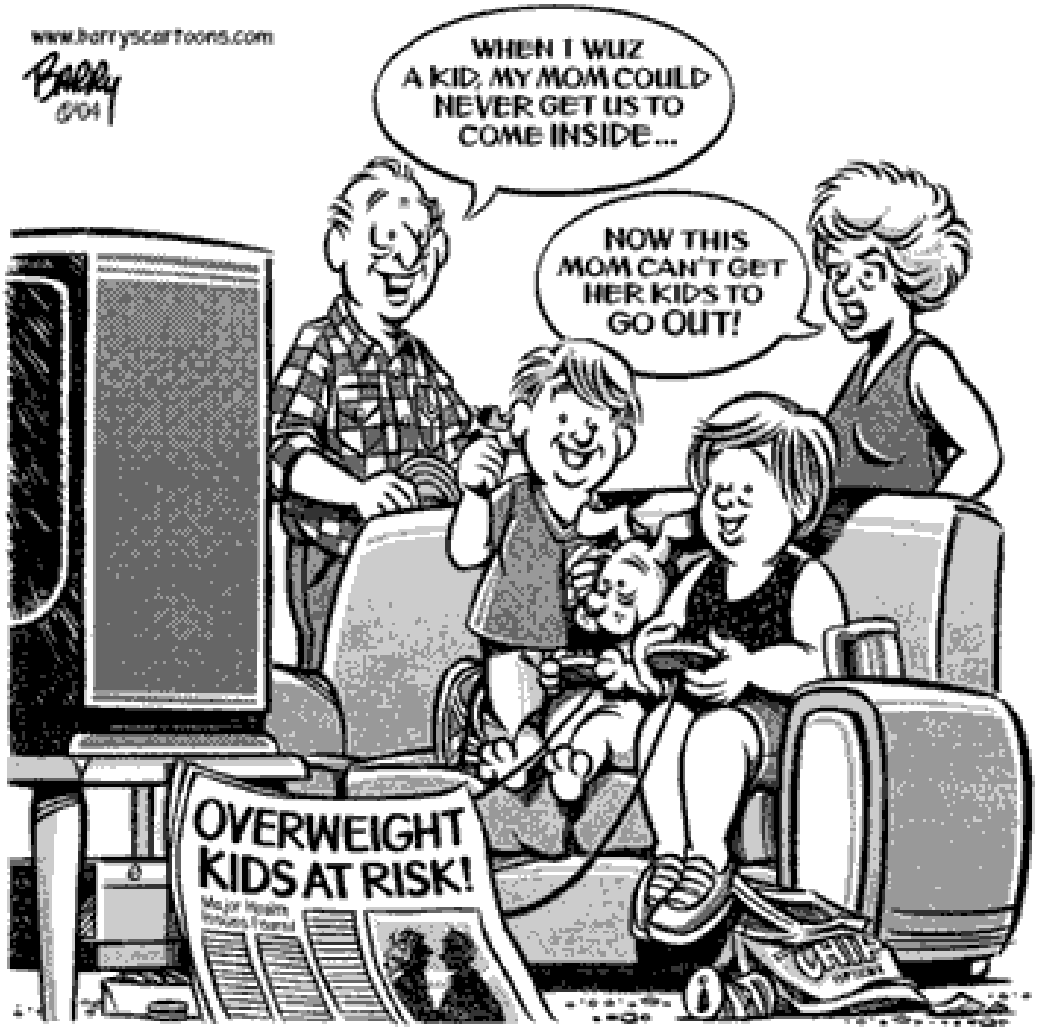
MUSCLE MASS: ↑–

rpstrength


LOSING WEIGHT VS.
LOSING FAT
@CARTERGOOD
Your Body Weight WILL Fluctuate
Daily & Weekly...
Fat Loss
Weight Loss
Fat loss happens slowly over weeks & months (or longer)...
SO CHILL. FOCUS ON FAT LOSS.


NEW SURVEY REPORTS HIGH OBESITY RATE IN YOUNG PEOPLE AND BABY BOOMERS...
©Fewings
fewings.ca
THEY GROW UP SO FAST DON'T THEY?
SURE DO, THEY BECOME MORE LIKE US EVERYDAY.

Why fat kids?


www.barryscartoons.com
WHEN I WUZ A KID, MY MOM COULD NEVER GET US TO COME INSIDE...
NOW THIS MOM CAN'T GET HER KIDS TO GO OUT!
OVERWEIGHT KIDS AT RISK!

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Thank you!