

DIETING SUCCESS: HOW YOU CAN HELP YOUR PATIENTS SUCCEED!

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DISCLOSURE/OFF LABEL DISCUSSION

- Dr White has no ties to the pharmaceutical industry through speaking, stock ownership, or other arrangement which could provide a real or perceived conflict of interest for this lecture.
- Dr White has written a book on the topic of metabolic adaptation and ways to overcome it. Sales of the book would directly financially benefit him. You can use the information in this presentation to educate patients and refer them to the trial referenced in the lecture. You do not have to refer people to the book entitled *The Part Time Diet: Conquer the Weight Loss Plateau*.
- There will be no off label discussion of prescription or over the counter drugs in this lecture. However, there will be a discussion of natural products and food and while the information is referenced, has not been evaluated by the Food and Drug Administration.

OBJECTIVES:

- At the conclusion of this lecture the successful learner will be able to:
 - Describe metabolic adaptation, its physiological underpinnings, and its implications for dieters
 - Describe the potential risks associated with Yo-Yo dieting
 - Describe the part-time diet philosophy and the tenets of successful part-time dieting approaches
 - Define why true dietary breaks are needed, not just altering intensities of continuous dieting
 - Identify metabolic boosters and define the magnitude of their effects
 - Identify drugs that can subvert weight loss and some therapeutic alternatives

METABOLIC ADAPTATION

Drop in Daily Calories (Kcal) Burned a Day

Stage	Drop in Daily Calories (Kcal)
Baseline	~160
5-Kg Wt Loss	~100
At Plateau	~80

Plateau occurred at 12.4% body weight loss.

Tremblay A. In J Obes 2013;37:759-64.

METABOLIC ADAPTATION CAN BE PARTIALLY COMPENSATED FOR BY EXERCISE AND IS LESS SEEN WITH DRUGS OR SURGERY

Mean Change in REE (in KJ) per 1 kg in Weight Loss

Intervention	Mean Change in REE (in KJ) per 1 kg in Weight Loss
Diet Alone	~-18
Exercise Alone	~-12
Diet + Exercise	~-8
Pharmacological	~-14
Surgical	~-16

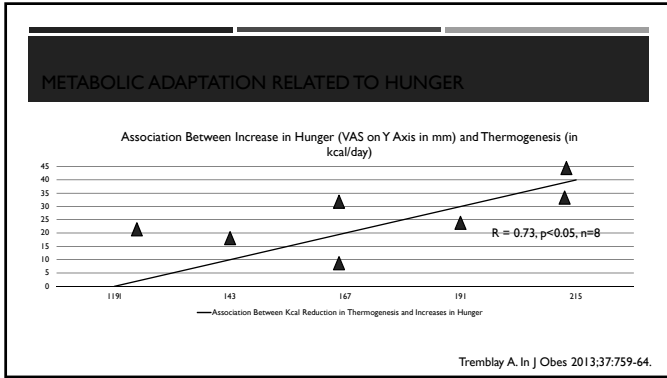
P<0.05 for all interventions versus dieting alone

Tremblay A. In J Obes 2013;37:759-64.

SELF ASSESSMENT QUESTION 1

1. What does exercising do to the loss of calorie burn associated with continuous calorie restriction?

- Enhances it
- Attenuates it
- Has no impact



THYROID HORMONE IN NORMAL PEOPLE

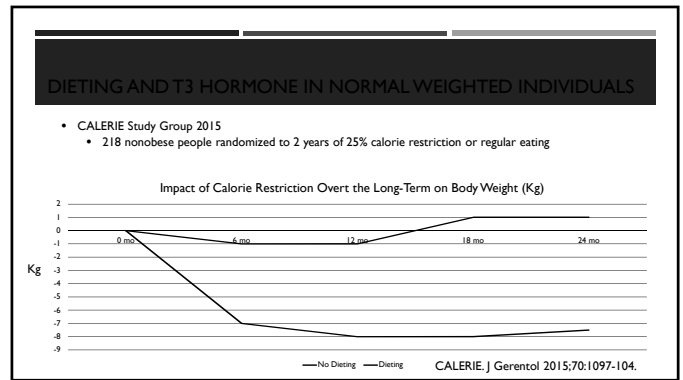
	T4	T3	rT3
Source	Thyroid gland (100%)	Thyroid Gland (30%) T4 Peripheral Conversion (70%)	T4 Conversion (100%)
Potency	++	++++	0

RELATIONSHIP BETWEEN T4 AND T3 IN ANOREXIA NERVOSA METABOLIC ADAPTATION

	Normal Controls	AN Baseline	43 Days in Treatment	84 Days in Treatment
Body weight	63.1±7.8kg	41.9±4.1*	47.8±4.9^	50.9±3.7^
T4	16.7±2.7 (pmol/L)	12.5±1.2*	13.1±1.8	13.4±2.6
T3	5.4±1.1 (pmol/L)	3.4±0.9*	4.4±0.9^	4.5±0.8^
REE Measured	5.48±0.67 (MJ/d)	4.14±0.32*	4.79±0.74^	4.70±0.56^

* Denotes vs. Controls, ^ Denotes versus Anorexia Nervosa Baseline, AN = Anorexia Nervosa

Haas V. Am J Clin Nutr 2005;81:889-96.



CALERIE STUDY: IMPACT OF CALORIE RESTRICTION ON METABOLISM AND THYROID HORMONES

	No Dieting	Calorie Restriction	P-Value
Calories Consumed (kcal/day)	12 mo: -20 24 mo: -4	12 mo: -342 24 mo: -173	P<0.001
REE (kcal/day)	12 mo: -1 24 mo: -7	12 mo: -83 24 mo: -71	P<0.001
TDEE (kcal/day)	12 mo: -20 24 mo: -26	12 mo: -193 24 mo: -181	P<0.001
T3 (ng/dL)	12 mo: -8.1 24 mo: -14.1	12 mo: -18.4 24 mo: -25.0	P<0.001
TSH (IU/mL)	12 mo: -0.02 24 mo: -0.15	12 mo: -0.21 24 mo: -0.23	P=0.04

CALERIE, J Gerontol 2015;70:1097-104.

IMPACT OF LOW AND VERY LOW CALORIE RESTRICTION IN OBESE PATIENTS ON THYROID HORMONE AND METABOLISM

- Wadden 1990 assessed the impact of two diets over 24 weeks on weight loss and thyroid hormone in 15 obese women

	1,200 Calorie Diet	400 Calorie Diet
T3 (% Change)	12 weeks: -40.6% 24 weeks: -26.2%	12 weeks: -52.2% 24 weeks: -22.2%
rT3 (% Change)	12 weeks: 31.4% 24 weeks: 25.7%	12 weeks: 14.6% 24 weeks: 7.2%
Weight loss (% Change)	8 weeks: -5.9% 12 weeks: -7.4% 24 weeks: -9.6%	8 weeks: -9.7% 12 weeks: -13.2% 24 weeks: -14.7%

Hardly no additional weight loss (1.6 kg) even though only 400 kcal/day for 4 weeks

* Denotes P<0.05 versus 1,200 calorie diet group

Wadden TA. Int J Obes 1990;14:249-58.

MATADOR TRIAL: REE RESULTS

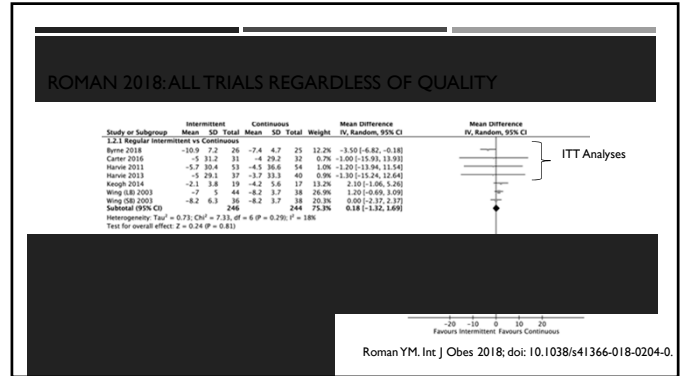
REE = Resting energy expenditure (# calories burned each day by just living)

	Continuous Diet	Part-Time Diet	P-Value
Baseline	9038±737	8619±963	
16 Weeks Active Dieting	-624±557	-502±481	0.48
6 Months of Follow-Up	-548±590	-452±494	0.65

Adjusted REE = Adjusted for decreases in weight

	Continuous Diet	Part-Time Diet	P-Value
Baseline	9038±737	8619±963	
16 Weeks Active Dieting	-749±498	-360±502	0.03
6 Months of Follow-Up	-770±523	-255±515	0.02

Part-Time Dieting Leads to **389 more calories** being burned each day over 16 weeks & **515 more calories** being burned even at 6 months after the end of dieting. Treadmill walking at 3.5 mph for 1-hour = 356 calories (as per: <https://www.livestrong.com/article/308255-calories-burned-per-hour-on-a-treadmill/>)



ROMAN 2018: TRIALS BROKEN UP BY STUDY QUALITY

- Trials using ITT Analyses
 - 3.15 (-6.22 to -0.09)kg additional weight loss (~7 lbs) with intermittent versus continuous dieting
- Trials not employing ITT Analyses
 - +0.98 (-0.36 to +2.32)kg additional weight gain (~2 lbs) with intermittent versus continuous dieting
 - These trials had very high attrition rates (people leaving the studies)
 - Keogh 2014 [6.4% attrition in intermittent vs 20% in continuous]
 - Wing 2003 [over 50% attrition in both groups]

Roman YM. Int J Obes 2018; doi: 10.1038/s41366-018-0204-0.

KEOGH 2014: DIFFERENT DIET LENGTHS

- Continuous Dieting: 1315 kcal/day for 8 weeks
- Part-Time dieting: 1315 kcal/day for 1 week then 1 week break (usual diet) for 8 weeks
 - Unlike other studies, this is only 4 weeks of active dieting
- Weight loss at 8 weeks: -3.2±2.1kg vs. 2.0±1.9kg (p=0.063)
- So dieting for half as many days resulted in losing 2.6 fewer lbs

Keogh JB. Clin Obes 2014;4:150-6.

SUPPORTING TRIALS: FIRST THREE USED ITT, LAST TWO EXCLUDED BECAUSE DIET INTENSITY CHANGED IF DIET RESULTS WERE NOT SEEN

Trial Name	Diet Details	Results: Contin vs. Part-Time
Carter 2016 (n=63)	1553 kcal every day for 12 weeks vs. 597kcal 2 days per week and rest on other days for 12 weeks	-4.0kg vs. -5.0kg (p=NS)
Harvie 2013 (n=115)	25% weekly calorie reduction every day vs. 70% calorie restriction 2 days per week and rest other days for 12 weeks	-3.7kg vs. -5.0kg (p=NS)
Harvie 2011 (n=107)	25% weekly calorie reduction every day vs. 75% calorie restriction 2 days per week and rest other days for 24 weeks	-4.5kg vs. -5.7kg (p=NS)
Rossner 1998 (n=101)	VLCD 420 or 530kcal/day everyday for 6 weeks vs VLCD diet 3 times for 2 weeks each (with breaks of 4 weeks in between)	Study A: -12.4kg vs -15.7kg (p=NS) Study B: -19.2kg vs. -27.2kg (p=NS) Study C: -12.8kg vs. -14.9kg (p=NS)
Arguin 2012 (n=25)	Continued energy restriction for 15 weeks followed by 5 weeks of weight stabilization vs. 5-week dieting followed by 5-week rest periods for 20 total weeks	-9.5kg vs -10.7kg (p=NS)

REFERENCES FOR TABLE

Trial Name	Diet Details
Carter 2016	Carter S. Clin Obes 2016;122:106-12.
Harvie 2013	Harvey M. Br J Nutr 2013;110:1534-7.
Harvie 2011 (n=107)	Harvie M. Int J Obes 2011;35:714-27.
Rossner 1998	Rossner S. Int J Obes 1998;22:190-2.
Arguin 2012 (n=25)	Arguin H. Menopause 2012;19:870-6.

SELF-ASSESSMENT QUESTION 3

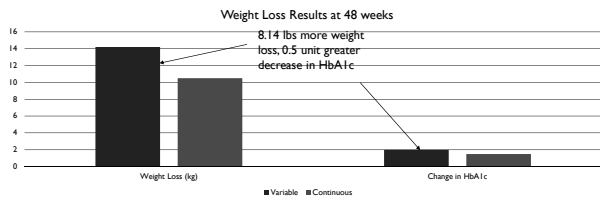
3. What can best be said about intermittent dieting versus continuous dieting in terms of weight loss?
- Trials assessing equal number of dietary days using intention to treat methodology found modest additional benefits from part-time dieting
 - All the trials showed impressive results and intermittent dieting is clearly the best approach
 - None of the trials found that it made any difference

A CAUTIONARY TALE: RESTS MUST BE RESTS

- In a trial by Wing 1994, 93 obese patients consumed 1,000-1,200 kcal/day for 48 weeks vs. 12 weeks of 400-500 kcal/day followed by 12 weeks of 1,000-1,200 kcal/day for 48 weeks
 - In effect low calorie diet versus low calorie alternating with VLCD
 - Alternating group cut 25% more calories over the study than the other group

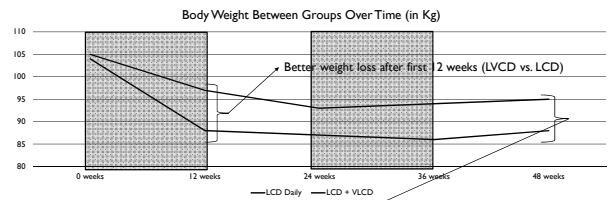
Wing RR. Am J Med 1994;97:354-62.

WING 1994 RESULTS (P<0.05 FOR BOTH)



Wing RR. Am J Med 1994;97:354-62.

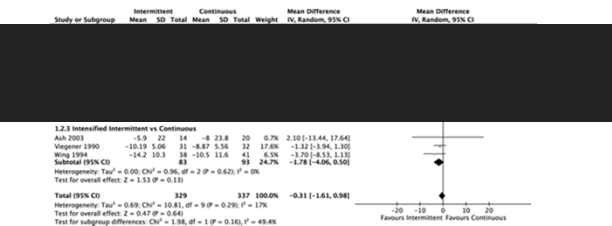
WING 1994: WHY DIETS PLATEAU AND REAL BREAKS ARE NEEDED



Where is the weight loss in either group for 24 weeks, especially the group with 1 additional round of VLCD built in?

Wing RR. Am J Med 1994;97:354-62.

VARIABLE CONTINUOUS DIETING VERSUS STEADY CONTINUOUS DIETING



METABOLIC BOOSTERS

	Calories Consumed	REE or BMR Effects	Activity Calories Burned	Weight Loss
Exercise	0	~100 kcal/day	~150-300 kcal/day	~7 lbs/diet
Green Tea/Caffeine	0	??	??	~3 lbs/diet
Stimulants	0	??	??	1.7 lbs/diet than without stimulants
Coconut Oil	120 kcal/tablespoon	~70 kcal/day	0	??
Grapefruit	52	??	??	1 lbs/diet than without grapefruit
Hot Chili Peppers	2 kcal	~30 kcal/day	0	??
Fiber	??	??	??	0.8 lbs/20g fiber per diet

Stimulants double or triple risk of mental GI, and heart rhythm ADEs!

White CM. The Part-Time Diet. Amazon Publications. 2018.

DIETARY SUPPLEMENTS FOR WEIGHT LOSS

- FDA Reports 317 "natural" weight loss aids sold from 2007 to 2016 secretly contain prescription drugs
- Sibutramine, ephedrine, fenfluramine
 - All banned by the FDA because of proven cardiovascular risks
- Phenolphthaline and loop diuretics
 - Dehydration and hypokalemia risk, phenolphthaline has possible cancer risk as well
- Non-FDA approved antidepressant (dapoxetine)
 - Risk of serotonin syndrome when combined with other serotonin enhancing drugs
 - Muscle rigidity, high body temperatures, seizures, muscle and kidney damage

Tucker J. JAMA Open 2018;1(6):e183337.doi:10.1001/jamanetworkopen.2018.3337

FEELING MORE FULL

Vinegar	Chili Peppers	Water	Slowly Digestible Starch	Resistant Starch	Low Carb Vegetables
+	+	++ if dehydrated ?? If Not	++	+++	++++

White CM. The Part-Time Diet. Amazon Publications. 2018.

SELF ASSESSMENT QUESTION 4

4. What can best be said about metabolic boosters?

- a) Aside from exercise, their impact on enhancing calorie burn or weight loss is very small and cannot overcome metabolic adaptation on their own
- b) They are the "amazing fat burning secrets of the stars"
- c) They actually suppress the number of calories burned each day instead of increasing it

CHEMICALS THAT INCREASE WEIGHT

- Things that release or mimic cortisol
 - Sleeplessness/sleep apnea – Good sleep hygiene or CPAP
 - No blue spectrum light before bed, no reading emails before bed, bed just for sleeping, sleeping when tired
 - Corticosteroids – Use topical varieties, adjuvants, and alternatives to lower systemic steroid dose
 - Insulin and sulphonylureas – Metformin, sitagliptin, exenatide are alternatives
 - THC – Lower THC varieties for medicinal purposes, reducing recreational use

White CM. The Part-Time Diet. Amazon Publications. 2018.

CHEMICALS THAT INCREASE WEIGHT

- Things that block histamine-1 receptors
 - Allergy antihistamines (diphenhydramine, fexofenadine, cetirizine, etc)
 - Antipsychotics (Huge increases in weight) – Ziprasidone and aripiprazole are alternatives
 - Antidepressants (tricyclics, mirtazapine) – Bupropion, venlafaxine, duloxetine are alternatives
- Seizure medications
 - Valproic acid, Lithobid – Topiramate is an alternative
- Progesterone stimulators
 - Medroxyprogesterone – Newer birth control pills and IUD, methods have lower risk

White CM. The Part-Time Diet. Amazon Publications. 2018.

CONCLUSIONS

- Healthy eating is important for overall health whether or not you lose weight
 - Mediterranean and DASH eating plans have most evidence of health benefits
 - Vegetarian(ish) - lacto/ovo type plans also fairly well established
- Losing weight is hard
 - Initial weight loss is faux weight loss
 - Continuous dieting sabotages future weight loss through metabolic adaptation
 - Metabolic adaptation is hardly impacted by touted metabolic boosters
 - Exercise, increased fiber intake, and good sleeping are important keys to weight loss
 - Part-time dieting (either intermittent fasting two or three days a week or dieting for a week or two before taking a week or two to rest) may be a way to sustain weight loss over a longer period of time
 - Longer-term data needed to firmly establish this method but current studies (especially MATADOR) are very positive
- Gaining weight after dieting is easier to do than losing it was
 - Less metabolic adaptation can help maintain
 - Practicing weight maintenance during rest days can help
 - Yo-yo dieting may be risky