COPE WEBINAR SERIES FOR HEALTH PROFESSIONALS

February 6, 2019

Preventing Metabolic Adaptation During Weight Loss

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Program Manager
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Nursing Education Continuing Education Programming Research

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OBJECTIVES

- Identify methods of assessment necessary to design a nutrition plan for fat loss.
- Create a macronutrient prescription to fuel activity and preserve lean body mass while in calorie deficit
- Design a sample resistance training workout designed for simultaneous fat loss and muscle growth.

CE DETAILS

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- Villanova University College of Nursing is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center Commission on Accreditation
- Villanova University College of Nursing Continuing Education/COPE is a Continuing Professional Education (CPE) Accredited Provider with the Commission on Dietetic Registration

CE CREDITS

- This webinar awards 1 contact hour for nurses and 1 CPEU for dietitians
- Suggested CDR Learning Need Codes: 2070, 2110, 3030, 5370
- Level 2
- CDR Performance Indicators: 4.1.2, 4.2.6, 4.2.7, 6.2.3

PREVENTING METABOLIC ADAPTATION DURING WEIGHT LOSS

Todd Miller, PhD, CSCS*D, TSAC-F, FNSCA
Stephanie Mull, MS, RD, CSSD, CSCS
George Washington University Weight Management Lab
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DISCLOSURE

Neither the planners or presenter have any conflicts of interest to disclose.

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Preventing Metabolic Adaptation During Weight Loss

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The Conventional Approach to Weight Loss

Cardio

Calorie Restriction

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Guidelines for Exercise

ACSM

Weight loss -- 150-250 minutes/week of moderate-intensity physical activity provides only modest weight loss. Greater amounts (ie. >250) provide clinically significant weight loss.

CDC

To lose weight and keep it off: You will need a high amount of physical activity unless you also adjust your diet and reduce the amount of calories you're eating and drinking. Getting to and staying at a healthy weight requires both regular physical activity and a healthy eating plan.

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Metabolic Adaptation

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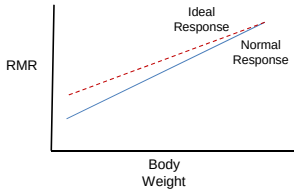
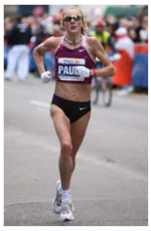
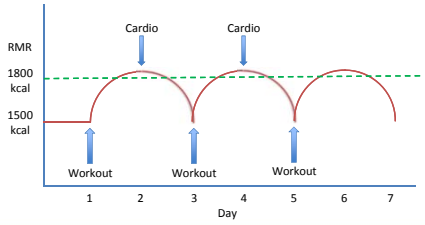
Metabolic Adaptation



Cardio or Strength Training?



Strength Training Rationale



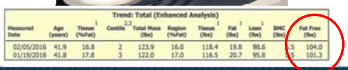
Lean Body Mass & Obesity

- Obesity is characterized by:
  - High muscle mass; low muscle quality
  - Decreased muscle function
- In overweight people, 20%-30% of weight lost during a weight loss intervention comes from fat free mass.

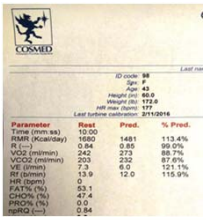
Is this loss in FFM obligatory?

Metabolism Based Eating

Measure Body Composition



Measure RMR



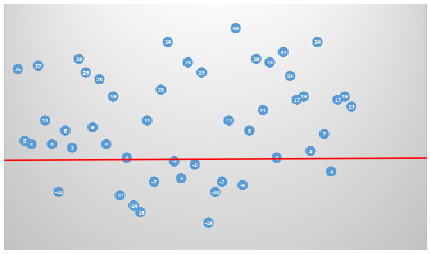
	Measured	Estimated with Mifflin St. Jeor	Estimated with Cunningham
RMR	2370	1689	2030
Lifestyle and TEF 300-400	300	300	300
TEE 350-600/hr	400	400	400
TOTAL	**3070**	**2389**	**2730**

	Measured	Mifflin	Cunningham
RMR	2370	1809	2030
Activity factor	1.6	1.6	1.6
Total	**3792**	**2894**	**3248**

41 kcal/kg = 3353

Daily calorie requirement ranges from 2389 - 3792

Percent Deviation from Predicted RMR



Why measuring RMR is critical
Client: Kia

What if we PREDICTED

- Predicted RMR: 2,742
- Add activity factor of 1.5
- Subtract 1,000
- Target calorie intake = 3,113

What we ACTUALLY did

- Actual RMR = 2,168
- Calorie Rx = 2,100

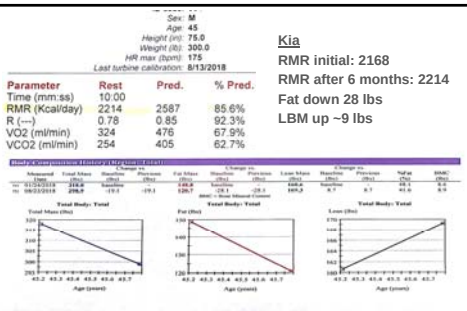
Client's calorie intake = 2,122

Recommended intake (from prediction)= 3,113/day

Difference from recommended = -991

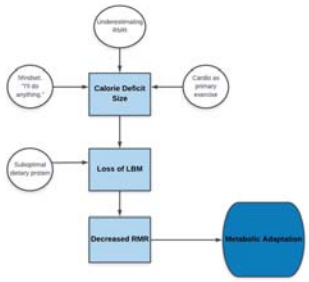
Actual Fat Loss = 28 lbs.

Change in Fat if fed predicted intake = 29 lb fat gain



Kia

RMR initial: 2168
RMR after 6 months: 2214
Fat down 28 lbs
LBM up ~9 lbs



Nutrition Planning

CALORIES

- General rule:
  - Males: at the RMR or up to 10% above
  - Females: at the RMR or 10-15% below
  - *No lower than 20% below the RMR.*

MACROS

- Fat 20% of calories
  - Allows for the creation of a large deficit while providing adequate carbohydrate and protein
- Protein based on FFM
- Carbs fill in the rest of the calories

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Calorie Prescriptions Based on RMR

10 clients: 6 males, 4 females

- Initial relative RMR range:
  -21% to +18%
  - 6 were below predicted
- Repeat relative RMR range:
  -15% to +37%
  - 2 were below predicted

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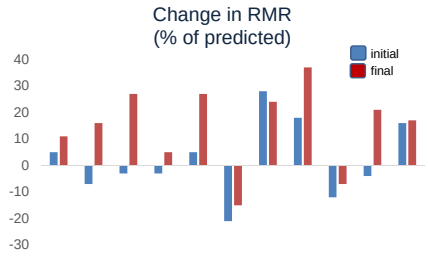

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Fat

20% of calories

1 avocado = 23 g
2 Tbsp PB = 14 g
1 oz almonds= 14 g
1 Tbsp olive oil = 13 g
2 Tbsp chia seeds = 9 g
2 Tbsp flaxseeds = 6 g
2 Tbsp hummus = 5 g
1 whole egg = 5 g

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RDA for Protein is Inadequate!

- 1.0-1.4 g/lb FFM during calorie restriction
  - Protein should not be >40% of calories.
  - Focus on lean proteins
  - Challenges: vegetarians and vegans
  - Supplements usually necessary
- Even distribution among meals for a positive nitrogen balance
- 10-20 grams after RT

Weijs, P. JM. & Wolfe, R.R. (2015). Exploration of the protein requirement during weight loss in obese older adults. *Clinical Nutrition*.

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Carbohydrate

Fill in the rest of the calories
Supports energy requirements and metabolic needs
Not the devil

- *"I don't eat bananas because they have too much sugar."*
- *"Carrots have too much sugar."*
- *"I only eat sweet potatoes and quinoa but avoid bread and pasta because they are too carb dense."*
- *"I try to limit my carb intake throughout the day." – said by a client who overeats on carb based snacks or sweets in the afternoon/evening.*

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Monitoring

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Importance of Food Tracking

- Food tracking is necessary for long-term compliance and success
- Self-report of intake not accurate
  - Bias gets progressively larger
  - Mathematical model calculations show a significant reduction in self-reported calorie deficits over 12 months
    - @month 3, EI -804 kcals/say
    - @month 6, EI -279 kcals/day
    - @month 12, EI -65 kcals/day

Guo, J., Robinson, J.L., Gardner, C., & Hall, K.D. (2018). Objective versus self-reported energy intake changes during low-carbohydrate and low-fat diets. Retrieved from https://www.biorxiv.org/content/early/2018/09/20/421321.

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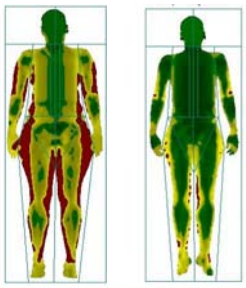

Mary's 15 month results:

July 2017: 189 lbs @ 38% fat, RMR 1558 (-6%)

October 2018: 157 @ 17.1% fat, RMR 1771 (+21%)

AVG calorie intake:
1st 8 months: 1556
after that: 1957
Total fat loss: 45 lbs
Total muscle gain: 13 lbs.
Total minutes of cardio: 0

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Re-Assessment of the Calorie Goal

s/s of increased RMR

- Hungry
- Poor sleep
- Fatigue esp. during workouts
- Slowed fat loss
- LBM loss
- Cognitive changes

s/s of decreased RMR

- Satiety
- Difficulty finishing meals and hitting nutrient goals
- Fat gain or slowed fat loss

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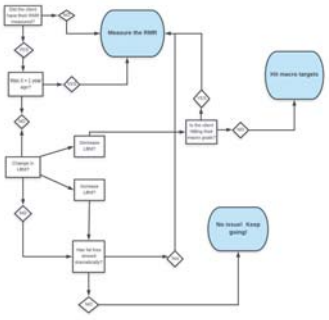
Decision Map for RMR Reassessment



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Thank You!

Questions?

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Assistant Professor of Psychiatry
Director of the Diabetes Prevention Support Center
The University of Pittsburgh School of Medicine

Behavior Change to Prevent Chronic Disease:
Psychology in Action

Wednesday, March 6, 2019
12:00PM - 1:00PM EST

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QUESTIONS & ANSWERS

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