Very Low Calorie Diet: In a Patient Care Setting

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Disclosures

- NovoNordisk: Consultant

*All relevant financial relationships have been mitigated

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Off Label Medications

- Medications that are not FDA approved for weight loss but used in an off label approach to assist with weight loss will be discussed.

Learning Objectives

- Describe the utility of a VLCD in patients with obesity including those with special circumstances (CKD, severe obesity, pre-operative surgical patients)
- Recognize the indications, limitations, and complications in patients treated with a VLCD
- Prescribe a VLCD nutritional treatment plan as part of a comprehensive obesity treatment program
- Describe the interdisciplinary team required to have successful VLCD program
- Describe weight loss outcomes and advantages of using a VLCD program utilizing either meal replacements, real food or a combination thereof.

What is a Very Low Calorie Diet?

- A nutritional intervention that emulate fasting by restricting carbohydrates and fat with a relative increase in protein intake
- The increased protein content may be partially responsible for the muscle mass preservation
- The weight-reducing action of these diets are rapid
- Despite the fact that the ketosis state lasts only 60 to 90 days at the start of treatment, the weight reduction may remain for up to 2 years

- **Active Phase**
  - Patients are started on a short period of calories and carbohydrates restriction (<700-800 kcal/day,<30-50 g/day, 13-25% of total calories), with an amount of protein equivalent to 0.8-1.2 g/day per kg of ideal body weight
  - Time frame : 12 weeks
    - associated with increased ketone bodies production by the liver, delivering lipid-derived energy to extra hepatic organs (e.g., heart, kidney, skeletal muscle, central nervous system),where they act as an alternative fuel source

Phases of VLCD program

- **Metabolic Stabilization**
  - a gradual reintroduction of protein foods is performed, still keeping the overall calories below 700-800 kcal/da
- **Transition Phase**
  - calories and carbohydrates are gradually raised to a low-calorie and, then, to a balanced diet with a
  - daily intake of 800-1500 and 1500-2250 kcal

Safety and Efficacy of VLCD

Reviews in Endocrine and Metabolic Disorders (2020) 21:5–16
https://doi.org/10.1007/s11154-019-09514-y

Efficacy and safety of very low calorie ketogenic diet (VLCKD) in patients with overweight and obesity: A systematic review and meta-analysis

Marco Castellana[1] · Eleonora Conte[1] · Angelo Cignarelli[1] · Sebastio Perrini[1] · Andrea Giustina[2] · Luca Giovanella[3,4] · Francesco Giorgino[1] · Pierpaolo Trimboli[3]

Published online: 9 November 2019

- Castellana M, Conte E, Cignarelli A, Perrini S, Giustina A, Giovanella L, Giorgino F, Trimboli P. Efficacy and safety of very low calorie ketogenic diet (VLCKD) in patients with overweight and obesity: A systematic review and meta-analysis. Rev Endocr Metab Disord. 2020 Mar;21(1):5-16.

Effects of VLCD compare to Bariatric Surgery

ORIGINAL ARTICLE

Very Low–Calorie Diet Mimics the Early Beneficial Effect of Roux-en-Y Gastric Bypass on Insulin Sensitivity and β-Cell Function in Type 2 Diabetic Patients

Clifton Jackness,[1] Wahida Karmally,[2] Gerardo Febres,[1] Irene M. Conwell,[1] Leaque Ahmed,[3] Marc Bessler,[3] Donald J. McMahon,[1] and Judith Korner[1]

- N= 11 RYGB N= 14 mean-matched for BMI, HbA1c, and diabetes duration
- Both groups lost an equivalent amount of weight over a mean study period of 21 days
- Changes in fasting glucose and fructosamine levels were similar
- Insulin sensitivity, acute insulin secretion after intravenous glucose administration, and b-cell function as determined by disposition index improved to a similar extent in both groups.

Jackness C, Karmally W, Febres G, Conwell IM, Ahmed L, Bessler M, McMahon DJ, Korner J. Very low-calorie diet mimics the early beneficial effect of Roux-en-Y gastric bypass on insulin sensitivity and β-cell Function in type 2 diabetic patients. Diabetes. 2013 Sep;62(9):3027-32.

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Body Composition Changes in a VLCD program

- Excess fat mass (FM), especially visceral fat, is associated with a variety of pathological conditions such as hypertension, dyslipidemia, diabetes, and even cancer as well as an increase in overall and cardiovascular mortality
- VLCD primary concern is the amount of fat-free mass (FFM; i.e.,muscular tissue) that is lost together with the FM leading to sarcopenic obesity
- Sarcopenic obesity constitutes a double impact on the health of patients, because the reduction in muscle mass and muscle strength is also a cause of cardiometabolic disorders, such as myocardial infarction and stroke, and other adverse health outcomes

Body Composition Changes After Very-Low-Calorie Ketogenic Diet in Obesity Evaluated by 3 Standardized Methods

Diego Gomez-Arbelaez,[1] Diego Bellido,[3] Ana I. Castro,[1,6] Lucia Ordoñez-Mayan,[1] Jose Carreira,[4] Cristobal Galban,[2] Miguel A. Martinez-Olmos,[1,6] Ana B. Crujeiras,[1,6] Ignacio Sajoux,[5] and Felipe F. Casanueva,[1,6]

[1]Division of Endocrinology, Department of Medicine, and [2]Intensive Care Division, Complejo Hospitalario Universitario de Santiago, 15706 Santiago de Compostela, Spain; [3]Division of Endocrinology, Complejo Hospitalario Universitario de Ferrol and Coruña University, 15405 Ferrol, Spain; [4]Family Medicine, Sanitary Area of Ferrol, 15405 Ferrol, Spain; [5]Medical Department PronoKal Group, 08009 Barcelona, Spain; and [6]Centro de Investigacion Biomedica en Red de Fisiopatologia de la Obesidad y Nutricion (CIBERobn), Instituto Salud Carlos III, 15706 Santiago de Compostela, Spain

Gomez-Arbelaez D, Bellido D, Castro AI, Ordoñez-Mayan L, Carreira J, Galban C, Martinez-Olmos MA, Crujeiras AB, Sajoux I, Casanueva FF. Body Composition Changes After Very-Low-Calorie Ketogenic Diet in Obesity Evaluated by 3 Standardized Methods. J Clin Endocrinol Metab. 2017 Feb 1;102(2):488-498

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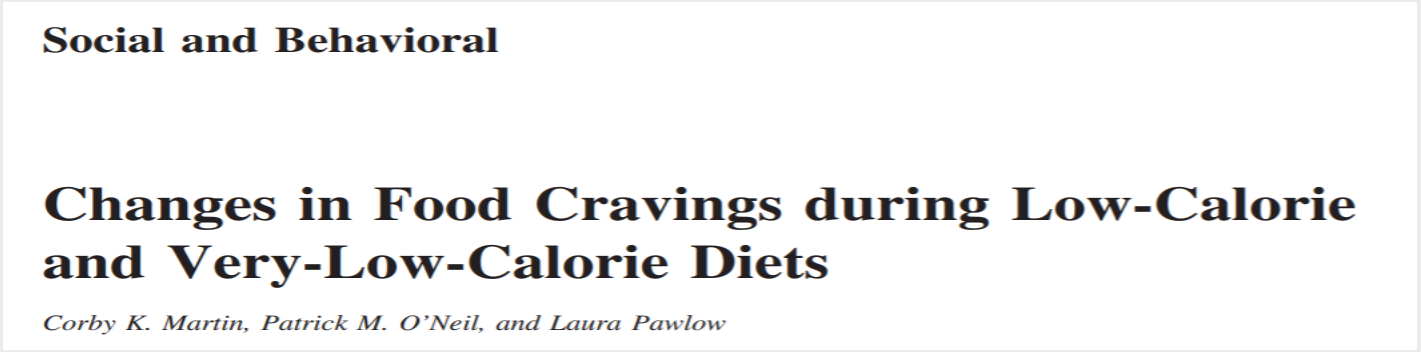
Challenges with VLCD?

- Hunger, Cravings
- Sustainability

Food Craving changes in Low calorie VS Very low calorie



Social and Behavioral

Changes in Food Cravings during Low-Calorie and Very-Low-Calorie Diets

Corby K. Martin, Patrick M. O'Neil, and Laura Pawlow

- Cravings did not increase rather decreased in both diets
- Compared with a primarily food-based diet , the VLCD resulted in significantly larger decreases in food cravings by the end of the 5th week of and did not rebound with resumption of solid food intake

Martin CK, O'Neil PM, Pawlow L. Changes in food cravings during low-calorie and very-low-calorie diets. Obesity (Silver Spring). 2006 Jan;14(1):115-21. doi: 10.1038/oby.2006.14. PMID: 16493129.

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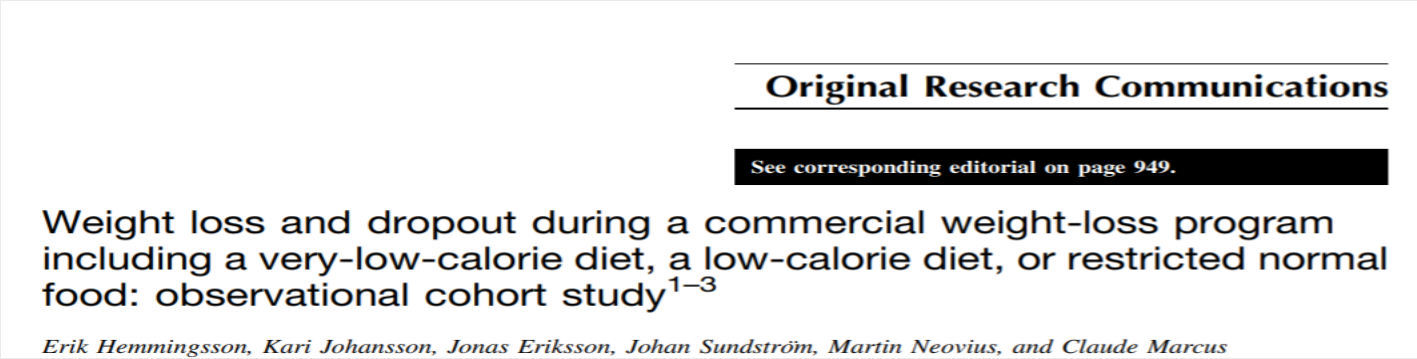
Challenges with VLCD?

- Hunger, Cravings
- Sustainability

Attrition Rate



Original Research Communications

See corresponding editorial on page 949.

Weight loss and dropout during a commercial weight-loss program including a very-low-calorie diet, a low-calorie diet, or restricted normal food: observational cohort study[1–3]

Erik Hemmingsson, Kari Johansson, Jonas Eriksson, Johan Sundström, Martin Neovius, and Claude Marcus

- Results: After 1 year, weight changes were -11.4 ± 9.1 kg with the VLCD (18% dropout), -6.8 ± 6.4 kg with the LCD (23% dropout), and -5.1 ± 5.9 kg with the restricted normal-food diet (26% dropout).
- Younger age and low initial weight loss predicted an increased dropout rate ($P < 0.001$)

Hemmingsson E, Johansson K, Eriksson J, Sundström J, Neovius M, Marcus C. Weight loss and dropout during a commercial weight-loss program including a very-low-calorie diet, a low-calorie diet, or restricted normal food: observational cohort study. Am J Clin Nutr. 2012 Nov;96(5):953-61. doi: 10.3945/ajcn.112.038265. Epub 2012 Sep 18. PMID: 22990030; PMCID: PMC3471207

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When to start the discussion with patients?

WILEY OBESITY REVIEWS

This Article | For Authors | Learn More | Submit

Obes Rev. 2021 Apr; 22(4): e13151.
Published online 2020 Dec 6. doi: 10.1111/obr.13151

PMCID: PMC7988601
PMID: 33283435

A systematic review and thematic synthesis of qualitative studies exploring GPs' and nurses' perspectives on discussing weight with patients with overweight and obesity in primary care

William Warr,[1] Paul Aveyard,[1] Charlotte Albury,[1] Brian Nicholson,[1] Kate Tudor,[1] Richard Hobbs,[1] Nia Roberts,[1] and Sue Ziebland[1]

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Low calorie diet vs Very low calorie diet

Wiley Online Library

Obesity Research

Free Access

Low-Calorie Diets and Sustained Weight Loss

Dr. Nicholas Finer

First published: 17 September 2012 | https://doi.org/10.1038/oby.2001.133 |

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Low-Calorie Diets

High protein	>40% protein, thus low carbohydrate and fat	Scarsdale Medical Diet
Low protein		Beverly Hills Diet
High fat	Restricted carbohydrate and protein	Drinking Man's Diet
Low fat	Restrict fat to <20% energy	Prescribed by dietitian
		Pritikin Diet
High carbohydrate	Effectively low-fat ± high-fiber	F Plan Diet
Low carbohydrate	Limits carbohydrate to <50 g/d	Yudkin Diet
Macronutrient choice	Choice from lists of macronutrients to encourage high-complex carbohydrate choices	No Counting Diet
Meal replacement	Liquid formula meals or snack bars of ~400 kcal (1.7 MJ) to replace 1 to 2 meals daily	Slim Fast R
Fad diets	Varied, but, e.g., food combining diets that require macronutrients to be eaten separately and separated by time	Hay Diet

Conclusions: Low-calorie diets can be effective treatment for long-term weight reduction, but the optimum way of delivering such diets remains unclear.

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Very-Low-Calorie Diets and Sustained Weight Loss

Wim H.M. Saris

Conclusions: VLCDs have been shown to be very effective in the treatment of obesity. However, their statement that most patients regain their lost weight is still true. VLCD in combination with active follow-up treatment seems to be one of the better treatment modalities for long-term weight maintenance success

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Indications for VLCD

- VLCDs are generally safe when used under proper medical supervision in people with a body mass index (BMI) greater than 30
- Use of VLCDs in people with a BMI of 27 to 30 should be reserved for those who have medical complications resulting from their obesity
  - Uncontrolled HTN
  - Uncontrolled T2DM
  - NASH

Physiological Mechanism of VLCD

- Weight loss occurs during a VLCD via the mechanism of ketosis-benign metabolic state
- Ketogenic diets for weight loss typically result in serum ketone levels around 0.33-0.72 mmol/L
- During ketosis, adipose tissue is broken down into free fatty acids and glycerol.
  - The free fatty acids are used for energy by organs such as the liver and muscles.
  - The ketones generated include beta-hydroxybutyrate and acetoacetate10 and are used by the brain as a substrate for metabolism.

Physiological Mechanism of VLCD

- How is different from Ketoacidosis?
  - Ketoacidosis will only occur when insulin is insufficient
  - Ketone levels in diabetic ketoacidosis may be as high as 25 mmol/L.
  - A diagnosis of ketoacidosis is suggested when ketone bodies are detected and glucose is >11.1 mmol/L and significant acidosis (arterial pH < 7.3 or venous bicarbonate <15 mmol/L).

VLCD: Medical Conditions Associated During the Program

- Hyponatremia and hypokalemia
  - Cessation of diuretic therapy
- Hypoglycemia
  - Require amendments to the dose of insulin in those with diabetes and consideration of reduction in dose of sulfonylureas (50%)
- Hypotension
  - average reduction in systolic blood pressure of 8.1% and diastolic blood pressure of 8.6% is expected
  - Require dose reduction in antihypertensive medications.

Common Side Effects for VLCD

- Fatigue
- Nausea
- Dizziness
- Constipation
- Diarrhea
- Cholelithiasis

Indications for VLCD

- Morbid obesity or complicated (T2DM, dyslipidemia, hypertension, metabolic syndrome, obstructive sleep apnea syndrome (OSAS), bone diseases or severe arthropathy);
- Severe obesity with bariatric surgery indication (in the preoperative period);
- Patients with severe comorbidities needing a rapid weight loss;
- Non-alcoholic fatty liver disease (NAFLD);
- Drug-resistant epilepsy.

- Muscogiuri G, Barrea L, Laudisio D, et al. The management of very low-calorie ketogenic diet in obesity outpatient clinic: a practical guide. J Transl Med. 2019;17(1):356. Published 2019 Oct 29. doi:10.1186/s12967-019-2104-z

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Contraindications for VLCD

- Pregnancy or lactation
- Cancer
- Active Cardiac dysfunction; Hearth failure (NYHA III-IV)
- Eating disorders and other severe mental illnesses, alcohol and substance abuse
- Hepatic disease or Renal failure
- Not committed to establishing new eating and life-style behaviors that will assist the maintenance of weight loss
- Not committed to taking the time to complete both the treatment and the maintenance components of a program

- Muscogiuri G, Barrea L, Laudisio D, et al. The management of very low-calorie ketogenic diet in obesity outpatient clinic: a practical guide. J Transl Med. 2019;17(1):356. Published 2019 Oct 29. doi:10.1186/s12967-019-2104-z

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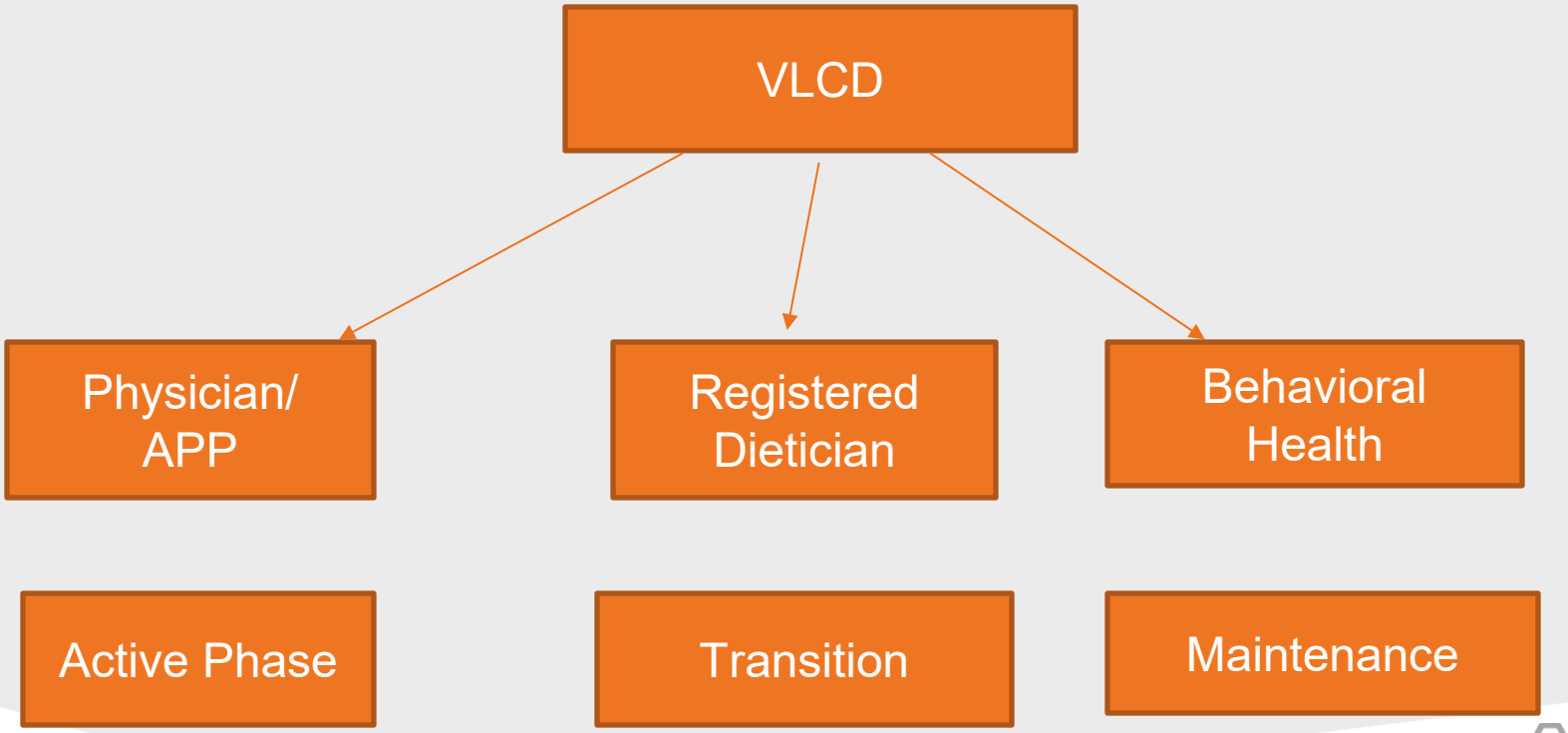
Multidisciplinary Team



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VLCD Formula Based vs Conventional Food

The nutrient composition of a formula-based very low calorie diet (FB-VLCD) compared with that provided by conventional food (CF)

Haynes, S.A ; Johnston, K.L ; Shittu, C ; Capehorn, M ; Cox, J.S.A ; Hewlett, B

Elsevier Ltd

Appetite, 2015-04-01, Vol.87, p.382-382

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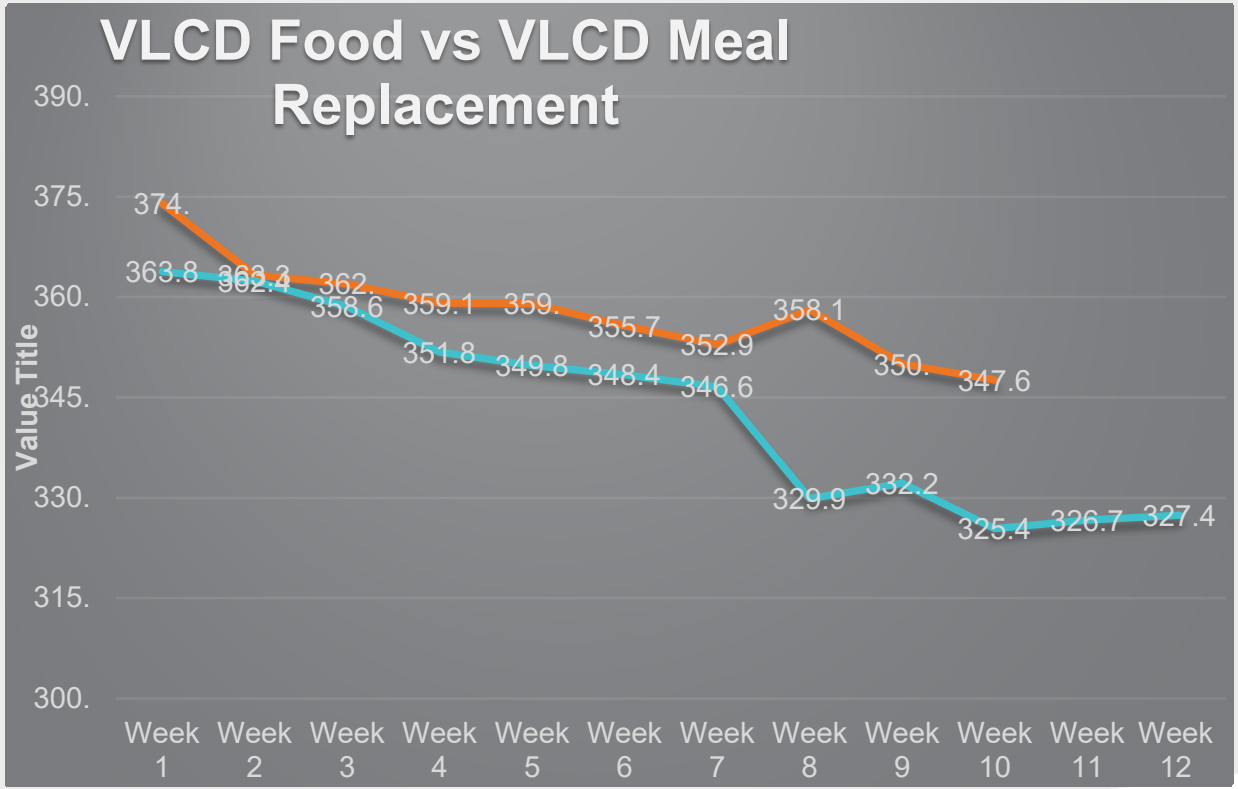
Focus Group : Formula Based VLCD , Conventional Food

- Formula Based VLCD
  - Pros
    - Time Efficient
    - Lack of Meal prep
    - Lack of Decision Fatigue
  - Cons
    - Cost
    - Side Effects
    - Palatability
- Conventional Food Based
  - Pros
    - Cost
    - “Real” Food
    - Minimal Side Effects
  - Cons
    - Meal Prepping
    - Not time efficient
    - “ Bored”



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- Chronic kidney disease
- Compensated liver disease
- Severe Obesity

VLCD and CKD

- Initial weight loss will occur in the form of a reduction in muscle glycogen stores and diuresis that will necessitate careful monitoring of goal dry weight in patients undertaking haemodialysis (note dry weight refers to the target weight after dialysis regardless of the BMI)
- To prevent muscle catabolism, the use of a VLCD program should always be accompanied by a program of physical activity where possible.
- Individuals with advanced kidney disease have limited capacity to handle acid loads and will not excrete ketones readily.

VLCD and CKD

- Weight goals for dialysis :
  - Assess Dry Weight to prevent fluid overload
- Protein needs:
  - Patients on dialysis require protein in the order of more than 1.1 g/kg of adjusted body weight per day
  - Patients not on dialysis require protein (0.75 mg/1.0 mg/ KG)
- Phosphate Binders
  - Phosphate binders may still be necessary for patients following the intensive phase of a VLCD. Monitoring of serum levels of phosphate for those at CKD stages 3B-5D is important and should be accompanied by advice on adjustment of binders when required
- Dialysate Bath Strength
  - May require adjustment and ongoing monitoring for those undertaking hemodialysis
  - Secondary due to the alterations in dietary sodium, potassium and acid load likely to be experienced.
  - Monitoring by the dialysis team is required

Table 3. Suggested VLCD prescription and suitability according to stage of CKD

	Intensive phase	Controlled phase	Maintenance phase
CKD stage 1-2	3 shakes per day, 2 cups low carbohydrate vegetables, liberal fluid	2 shakes per day, 1 light meal,[a] 1 serve dairy (~400 kJ/100 Kcal	1 shake per day, 2 light meals,[a] 2 serves dairy (~400 kJ /100
CKD stage 3-4 Stage 3—suitable for standard VLCD programme with close monitoring of renal function and electrolytes initially.	3 shakes per day, 2 cups low carbohydrate vegetables,[b] fluid intake as per medical team and 1-2 teaspoon oil daily	2 shakes per day, 1 light meal,[a,b] 1 serve dairy (~400 kJ/100 Kcal or 150 mL reduced fat milk),1 serve fruit* (300 kJ/70 Kcal) and fluid as per medical team	1 shake per day, 2 light meals,[a,b] 2 serves dairy (~400 kJ/100 Kcal each or 400 mL reduced fat milk), 2 serves fruit,[b] (~300 kJ/70 Kcal each) and fluid as per

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- Chronic kidney disease
- Compensated liver disease
- Severe Obesity

Clinical and Translational GASTROENTEROLOGY

Clin Transl Gastroenterol. 2020 Sep; 11(9): e00231.
Published online 2020 Sep 15.
doi: 10.14309/ctg.0000000000000231

PMCID: PMC7494144
PMID: 33094956

Feasibility of a Very Low Calorie Diet to Achieve a Sustainable 10% Weight Loss in Patients With Nonalcoholic Fatty Liver Disease

Jadine Scragg, MSci,[1,2] Leah Avery, PhD,[3,4] Sophie Cassidy, PhD,[1] Guy Taylor, PhD,[1] Laura Haigh, MPH,[2,4,5] Marie Boyle, MD,[4,5] Michael I. Trenell, PhD,[1] Quentin M. Anstee, PhD,[2,4,5] Stuart McPherson, MD,[4,5] and Kate Hallsworth, PhD[2,4,5]

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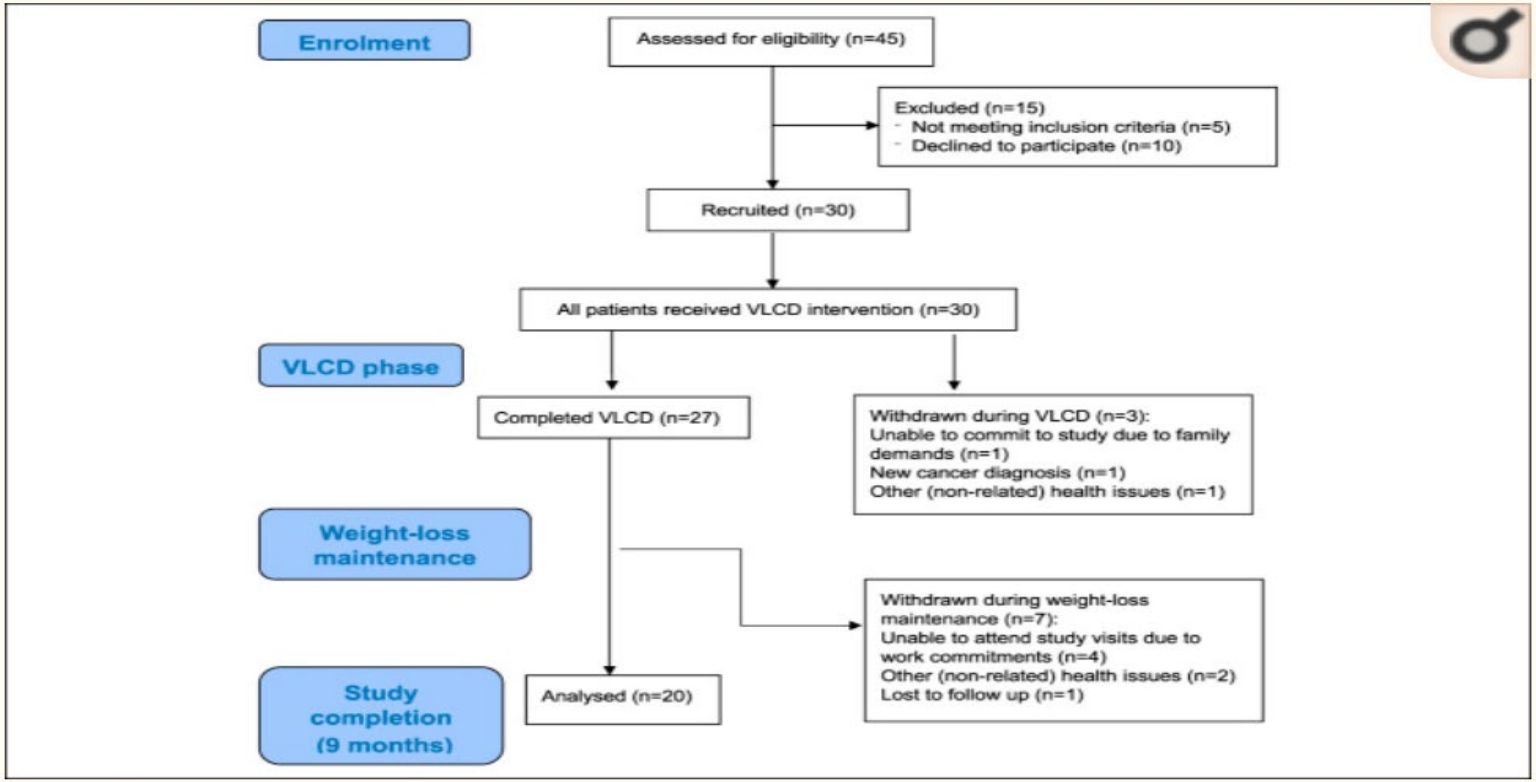

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Primary Aim

- Determine whether a minimum 8-week VLCD is a feasible and acceptable therapy to achieve a target weight loss of 10% in patients with clinically significant NAFLD
- Whether weight loss could be maintained for at least 6 months after completion of the VLCD

frontiers in Endocrinology

Efficacy of a 2-Month Very Low-Calorie Ketogenic Diet (VLCKD) Compared to a Standard Low-Calorie Diet in Reducing Visceral and Liver Fat Accumulation in Patients With Obesity

Guilherme Moura Cunha[1], German Guzman[2], Livia Lugarinho Correa De Mello[3], Barbara Trein[3], Luciana Diniz Carneiro Spina[4], Isabela Bussade[5], Juliana Marques Prata[6], Ignacio Sajoux[2] and Walmir Countinho[3]*

OPEN ACCESS

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- Chronic kidney disease
- Compensated liver disease
- Severe Obesity / Preoperative Weight Loss

> Obes Surg. 2020 Jun;30(6):2099-2107. doi: 10.1007/s11695-020-04446-y.

Preoperative Weight Loss via Very Low Caloric Diet (VLCD) and Its Effect on Outcomes After Bariatric Surgery

Sarah Ying Tse Tan [1], Pooi Ling Loi [1], Chin Hong Lim [2], Sonali Ganguly [1], Nicholas Syn [3], Kwang Wei Tham [1], Hong Chang Tan [1], Weng Hoong Chan [2], Hui Mei Wong [4], Phong Ching Lee [5]

Affiliations + expand

PMID: 32077058 DOI: 10.1007/s11695-020-04446-y

- Reason for Consult : Weight Management with recent diagnosis of T2DM
- HPI: 40 yo female BMI 59.3 (347 lbs) T2DM, Migraines, Anxiety and Depression, PCOS presents with interest in weight loss options. She reports she was in the work up process for bariatric surgery with a different institution between 2018 and 2019. Her experience was the team was difficult as she felt she was being rushed into surgery without the guidance she hoped she would hope to obtain during the process. With her recent diagnosis of T2DM she is highly motivated for weight loss. *Her goal weight is 200 lbs and is interested in pharmacotherapy options to obtain her goal weight.*
- Weight Hx:
  - Overweight/Obese Since: childhood
  - Lowest Adult WT: 340 lbs.
  - Highest Adult WT: 361 lbs.

- Current Diet Concerns:
  - Feeling of Hunger: Y
  - Lack of Satiety: Y
  - Cravings: Y
  - Portions: Large

- 24 hour Food Recall:
  - Breakfast: Skipping/ Eggs and 3 slices Toast with Orange Juice
  - Lunch: Chicken and Pasta
  - Dinner: Chicken and Pasta
  - Snacks : Tropical fruits and 1 can of Pepsi daily
- Exercise:
  - Type(s): Limited due to knee pain associated with weight

- PMH
  - T2DM
  - PCOS, Hirsutism
  - Migraines
  - Anxiety and Depression
  - Vitamin D deficiency
- PSH
  - None
- Allergies
  - NKDA

- Medications
  - Metformin 500mg XR
  - Spironolactone 50 mg
  - Ubrogepant 50 mg PRN
  - Vitamin D 2000 units
- Family History
  - Patient adopted
- Smoking History
  - None

	5/29/2020 0906
CHEMISTRY GENERAL	
Sodium	139 *
Potassium	4.2 *
Chloride	102 *
CO2, POC	24 *
Anion Gap	
BUN	10 *
Creatinine	0.69 *
Bun / Creat Ratio	NOT APPLICABLE *
Glucose	167 *
Calcium	9.2 *
Calcium, Ionized	
Magnesium	

	5/29/2020 0906
ENDOCRINE/FERTILITY	
Hemoglobin A1C	7.3 *

eGFR	
eGFR African American	126 *
eGFR Non-African A...	109 *
GFR - African Amer...	
Bilirubin Total	0.3 *
Bilirubin Direct	
Aspartate Aminotra...	10 *
Alanine Aminotrans...	7 *
Alkaline Phosphatase	86 *
LIPID PROFILE	
Cholesterol	197 *
Triglycerides	225 *
HDL	63 *
LDL Cholesterol	100 *
Cholesterol/HDL Ratio	3.1 *
Non HDL Chol. (LDL...	134 *

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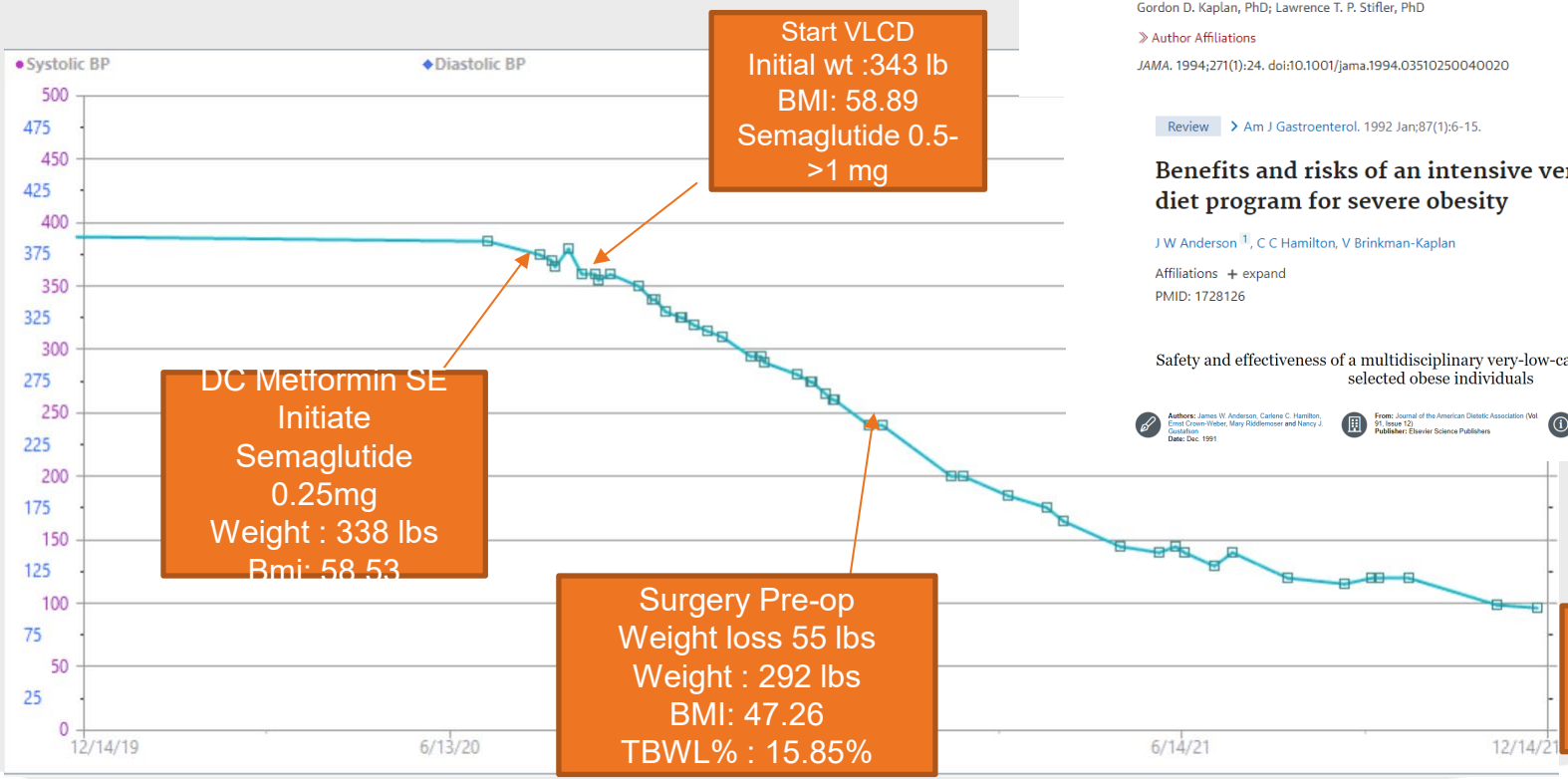
Patient A.J. Weight Graph



Start VLCD
Initial wt :343 lb
BMI: 58.89
Semaglutide 0.5->1 mg

DC Metformin SE
Initiate Semaglutide 0.25mg
Weight : 338 lbs
Bmi: 58.53

Surgery Pre-op
Weight loss 55 lbs
Weight : 292 lbs
BMI: 47.26
TBWL% : 15.85%

Indications
Contraindications

Article

January 5, 1994

Very Low-Calorie Diets for Obesity

Gordon D. Kaplan, PhD; Lawrence T. P. Stifler, PhD

Author Affiliations

JAMA. 1994;271(1):24. doi:10.1001/jama.1994.03510250040020

Review > Am J Gastroenterol. 1992 Jan;87(1):6-15.

Benefits and risks of an intensive very-low-calorie diet program for severe obesity

J W Anderson [1], C C Hamilton, V Brinkman-Kaplan

Affiliations + expand

PMID: 1728126

Safety and effectiveness of a multidisciplinary very-low-calorie diet program for selected obese individuals

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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[1–3]

Kari Johansson, Martin Neovius, and Erik Hemmingsson

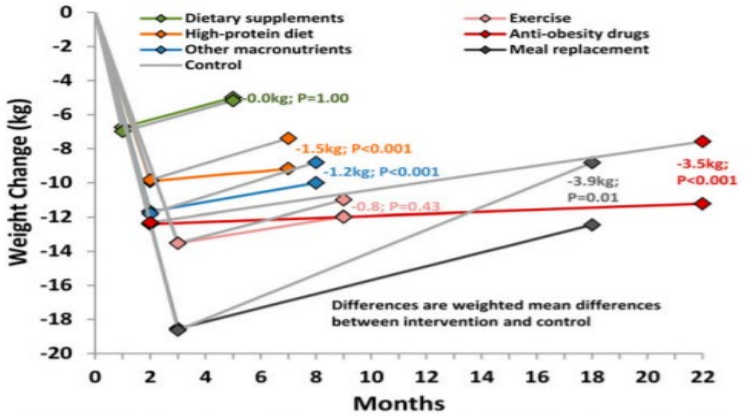

FIGURE 3. Overview of changes in body weight during the rapid weight-loss phase and the weight-loss maintenance period in 20 randomized controlled trials that evaluated different anti-obesity drug, diet, and exercise weight-loss maintenance strategies after an initial very-low-calorie diet or low-calorie diet (<1000 kcal/d). The gray lines represent the control subjects in each subcategory. Anti-obesity drugs: sibutramine and orlistat. Dietary supplements: green tea, high fiber, oil supplement, and conjugated linoleic acid. Other macronutrients: low fat, low glycemic index, and Healthy Eating Pyramid. The random-effects model was used to weight and pool the studies within each treatment arm (intervention and control) after the very-low-calorie diet or low-calorie diet period and maintenance period. The mean increase for each month was estimated from these 2 measurements. Weighted mean differences between the intervention and control groups at follow-up were estimated by using a random-effects model.

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Anti-Obesity Pharmacotherapy s/p Bariatric Surgery

Review > Curr Obes Rep. 2021 Jun;10(2):81-89. doi: 10.1007/s13679-021-00425-1.
Epub 2021 Jan 25.

Use of Weight Loss Medications in Patients after Bariatric Surgery

Ilana P Redmond [1], Alpana P Shukla [2], Louis J Aronne [2]

Affiliations + expand

PMID: 33492629 DOI: 10.1007/s13679-021-00425-1

The utility of weight loss medications after bariatric surgery for weight regain or inadequate weight loss: A multi-center study

Fatima Cody Stanford, M.D., M.P.H., M.P.A.,[a,b,c,*] Nasreen Alfaris, M.D., M.P.H.,[a,c,d] Gricelda Gomez, B.S.,[c,e] Elizabeth T. Ricks, M.S.,[f,g,h] Alpana P. Shukla, M.D.,[f] Kathleen E. Corey, M.D., M.P.H., M.M.Sc.,[c,i] Janey S. Pratt, M.D.,[c,j] Alfons Pomp, M.D.,[k] Francesco Rubino, M.D.,[l] and Louis J. Aronne, M.D.[g]

▸ Author information ▸ Copyright and License information Disclaimer

Redmond IP, Shukla AP, Aronne LJ. Use of Weight Loss Medications in Patients after Bariatric Surgery. Curr Obes Rep. 2021 Jun;10(2):81-89
Stanford FC, Alfaris N, Gomez G, et al. The utility of weight loss medications after bariatric surgery for weight regain or inadequate weight loss: A multi-center study. Surg Obes Relat Dis. 2017;13(3):491-500. doi:10.1016/j.soard.2016.10.018

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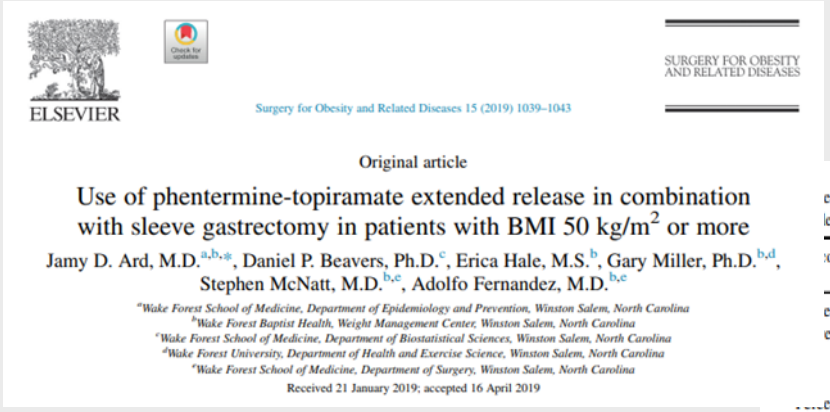
Anti-Obesity Medications s/p Bariatric surgery



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SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Use of phentermine-topiramate extended release in combination with sleeve gastrectomy in patients with BMI 50 kg/m^2 or more

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lel-adjusted least square means (LS means) percent excess weight loss, percent initial weight change, and BMI at follow-up

ome	Postop visit	LSG alone n = 40 LS means (95% CI)	LSG + phen/top n = 13 LS means (95% CI)	LS mean difference (95% CI)	*P* value
ent excess	3 mo	−38.59 (−42.90 to −34.28)	−45.19 (−52.78 to −37.61)	-6.60 (−14.36 to 1.15)	.093
eight loss (%)	6 mo	−48.90 (−53.70 to −44.10)	−57.99 (−66.41 to −49.57)	−9.09 (−17.91 to −.27)	.044
	12 mo	−56.40 (−62.46 to −50.35)	−68.98 (−79.62 to −58.34)	−12.58 (−24.14 to −1.02)	.033
	24 mo	−48.19 (−55.20 to −41.19)	−66.43 (−79.04 to −53.81)	−18.23 (−32.05 to −4.41)	.011
ent initial	3 mo	−21.46 (−23.96 to −18.97)	−25.24 (−29.63 to −20.84)	−3.77 (−8.27 to .72)	.098
weight change (%)	6 mo	−27.25 (−29.97 to −24.53)	−32.79 (−37.56 to −28.02)	−5.54 (−10.52 to −.56)	.030
	12 mo	−31.43 (−34.86 to −28.01)	−39.34 (−45.36 to −33.32)	−7.91 (−14.43 to −1.39)	.018
	24 mo	−27.00 (−31.02 to −22.99)	−38.16 (−45.39 to −30.94)	−11.16 (−19.07 to −3.24)	.007
BMI (kg/m^2)	3 mo	45.28 (43.71–46.84)	42.31 (39.78–44.84)	−2.97 (−5.75 to −.19)	.037
	6 mo	41.93 (40.23–43.63)	37.61 (34.83–40.38)	−4.33 (−7.40 to −1.25)	.007
	12 mo	39.53 (37.43–41.63)	33.46 (29.94–36.98)	−6.07 (−10.03 to −2.11)	.003
	24 mo	41.96 (39.47–44.45)	33.79 (29.47–38.12)	−8.16 (−13.03 to −3.30)	.001

LSG = laparoscopic sleeve gastrectomy; LK Means = least square means; CI = confidence interval; BMI = body mass index

- Ard JD, Beavers DP, Hale E, Miller G, McNatt S, Fernandez A. Use of phentermine-topiramate extended release in combination with sleeve gastrectomy in patients with BMI 50 kg/m2 or more. Surg Obes Relat Dis. 2019 Jul;15(7):1039-1043

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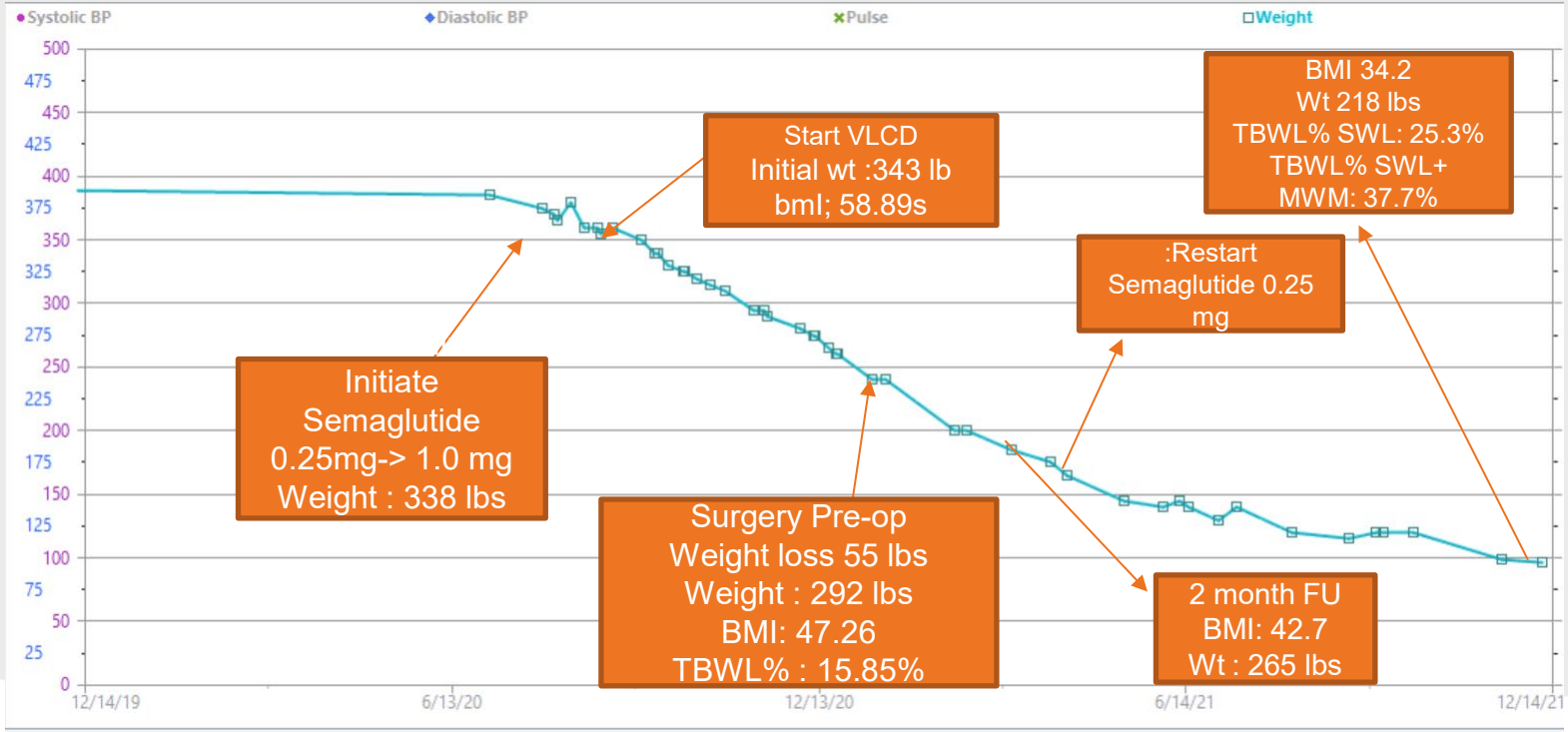
Patient A.J. Weight Graph



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The End

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