

授課講師學經歷

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課程名稱(主題)	極低熱量飲食之減重效應
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授課內容摘要

隨著飲食及生活方式的改變，肥胖的盛行率逐年上升，國內肥胖盛行率以第三次國民營養調查，以 $BMI \geq 25\text{kg}/\text{m}^2$ 為肥胖界定標準，男性為 24.8%，女性為 25.5%；因此與肥胖相關的慢性疾病，如糖尿病、高血壓及高脂血症等，也隨之增多，傳統飲食治療的減重效果，常令人感到失望，因此近年來醫界利用極低熱量飲食(Very Low Calorie Diet, VLCD)(每日 400-800 大卡熱量的高蛋白飲食)，來幫助肥胖者減重，進而達到減少其他相關疾病的目標。肥胖者因為醫療上、行為上或生活型態的理由，需要快速的體重減輕時，VLCD 是一個可以考慮的選擇；它的特點有 VLCD 提供每日 400 到 800 大卡的熱量、蛋白質 0.8-1.5 克/公斤理想體重/天、能供應足量的營養，包含維生素、礦物質、電解質及必需脂肪酸、可以完全取代日常的飲食。VLCD 設計的基本原理，即是利用限制身體經由飲食中所攝取的熱量，來達到能量攝取的負平衡，進而達到體重減輕的目的。適用於中度至重度肥胖 ($BMI \geq 30$)，且具有強烈動機者。研究證明 VLCD 在快速減重、降低體脂肪，但長期而言當停止 VLCD 後，仍有復重的情形發生；VLCD 在體重控制初期，可以獲得較大的減重效果，但仍須加上體重維持追蹤計畫，包括行為治療、營養教育及運動，才能達到長期的體重維持，提升健康的目的。

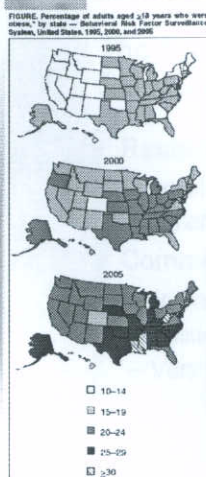
Very Low Calorie Diet 減重效應

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State-Specific Prevalence of Obesity Among Adults --- United States, 2005



- 10 leading U.S. health indicators
- The prevalence of obesity among adults continued to increase
- In 2005, adult population
 - 60.5% overweight
 - 23.9% obese
 - 3.0% extremely obese.

CDC, Morbidity and Mortality Weekly Report, 2006, 55(36):985-988

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Percentage of adults aged ≥ 18 years who were obese

TABLE. Percentage of adults aged ≥ 18 years who were obese,* by demographic characteristics — Behavioral Risk Factor Surveillance System, United States, 1995, 2000, and 2005

Characteristic	1995 (n = 110,252)		2000 (n = 172,157)		2005 (n = 233,726)	
	%	(95% CI)	%	(95% CI)	%	(95% CI)
Total	15.3	(14.8–15.7)	18.8	(18.4–20.2)	23.9	(23.5–24.2)
Men	15.8	(14.8–16.4)	20.2	(19.5–20.9)	24.2	(23.4–24.8)
Women	14.9	(14.3–15.5)	19.4	(18.8–19.9)	23.5	(23.1–24.0)
Age group (yrs)						
18–29	10.2	(9.3–11.1)	13.5	(12.7–14.4)	17.7	(16.7–18.7)
30–39	14.3	(13.4–15.3)	20.2	(19.2–21.1)	24.4	(23.5–25.3)
40–49	17.0	(16.7–19.0)	23.0	(21.8–23.9)	26.5	(25.6–27.3)
50–59	21.6	(19.6–23.5)	25.6	(24.4–26.8)	29.5	(28.9–30.4)
60–69	19.4	(18.0–20.8)	22.9	(21.3–24.2)	25.1	(23.7–26.9)
≥ 70	12.2	(11.1–12.2)	15.5	(14.4–16.5)	18.3	(17.5–19.1)
Race/Ethnicity						
Non-Hispanic white	14.5	(13.9–15.0)	18.5	(18.0–18.9)	22.6	(22.2–23.0)
Non-Hispanic black	22.7	(21.1–24.3)	29.3	(27.8–30.8)	33.9	(32.5–35.2)
Hispanic†	15.8	(14.5–19.0)	23.4	(21.5–25.4)	26.5	(24.9–28.1)
Other	9.7	(7.6–11.8)	12.0	(10.3–13.8)	16.0	(14.4–17.6)

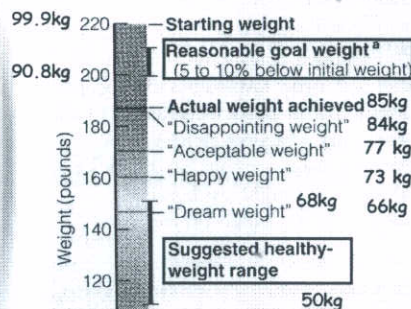
*Persons with a body mass index (BMI) of ≥ 30.0 ; self-reported weight and height were used to calculate BMI (weight [kg] / height [m]²).
 †Confidence interval.
 ‡Highly of any race.

CDC, Morbidity and Mortality Weekly Report 2006, 55(36):985-988

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Reasonable goals versus unreasonable expectations



Foster GD, et al., 1997,

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Results of USDA Scientific Review of Popular diets

Weight loss

- Diets that reduce caloric intake result in weight loss, all popular diets result in short-term weight loss if followed.

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Results of USDA Scientific Review of Popular diets

Nutritional adequacy

- High-fat, low carbohydrate diets are low in vitamins E, A, B₁, B₆, and folate, and the minerals Ca, Mg, Fe and K. They are also low in dietary fiber.
- Very-low-fat diets are low in vitamins E and B₁₂ and the mineral Zn.
- With proper food choices, a moderate-fat, balanced nutrient reduction diet is nutritionally adequate.

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Results of USDA Scientific Review of Popular diets

Metabolic parameters

- Low-carbohydrate diets cause ketosis and may significantly ↑ blood uric acid concentrations.
- As body weight ↓ blood lipid levels ↓
- Energy restriction improves glycemic control.
- As body weight ↓ blood insulin and plasma leptin levels ↓
- As body weight ↓, blood pressure ↓

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The type of medical nutrition therapy for obesity

- Restricted-energy diets
- Formula diets and meal replacement programs
- Commercial programs
- Extreme energy restriction diets
 - Fasting
 - Very low calorie diet (VLCD)

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Extreme energy restriction

- Extreme energy restriction provide < 800 Kcal/day
- Starvation or fasting diets provide < 200 Kcal/day
 - Fasting is seldom prescribed as a treatment of obesity.
 - Over 50% of the rapid weight reduction is fluid, which often leads to serious hypotension problems.
 - 1950年代的末期，絕對的禁食曾被用於降低重度肥胖病人的體重控制上。

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Vitamin and mineral supplements and weight reduction program

- Vitamin and mineral supplements that meet age-related RDA are usually recommended with weight reduction programs that provide less than 1200 kcal for women or 1400 kcal for men.

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Extreme energy restriction

- Very-Low-calorie Diets(VLCD)
在1976-1977年相當流行，處方通常不含有任何維生素、礦物質或電解質，提供約300-400大卡的熱量，約有超過十萬人用過這種飲食配方，其中有60個死亡案例被認為與此種飲食配方有關。

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1970年代使用的VLCD配方

- 使用VLCD的初期，會造成嚴重的利尿作用與鈉離子的流失，造成電解質與礦物質的平衡失調，尤其是鉀離子與心律不整間更有著密切的關係
- 使用VLCD，心電圖的變化為重要的危險信號

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1990年代所使用的VLCD配方

- 高生物價的蛋白質，建議用量為每天50到100公克，有以標準體重來計算每日應提供的蛋白質量(1.5公克/公斤)
- 目前使用的VLCD飲食計畫
 - 蛋白質主要來源為蛋類與牛奶
 - 添加符合RDA維生素、礦物質及電解質
- 醣類含量約每天100公克，可減少鈉離子的損失、降低姿勢性低血壓的發生率，並且較不會有負氮平衡的副作用

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Extreme energy restriction

Very-Low-calorie Diets(VLCD)

Characteristics:

- Rich in protein (0.8-1.5g/Kg IBW /day)
- A full complement of the RDAs for vitamins, minerals, electrolytes, and essential fatty acids
- Completely replaces usual food intake
- Given for a period of 12-16 weeks

Patients who follow a VLCD lose 20 Kg in 12-16 weeks and maintain 33-50% of this loss in the following year.

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Extreme energy restriction

Very-Low-calorie Diets

- VLCD should be undertaken only with the supervision of a multidisciplinary health team with monitoring by a physician and nutrition counseling by a RD.
- The criteria of the candidates
 - BMI>30 for whom other diet programs with psychotherapy have been unsuccessful.
 - BMI 27-30 who have comorbidities or other risk factors.

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What's VLCD

- 400-800 kcal/day
- Completely replaces all usual food intake
- For moderately to severely obese people, VLCDs produce early and substantial weight loss
- Portion and calorie-controlled servings and liquid diets help promote adherence
- A safe and effective method of rapid weight loss provided that medical supervision is maintained.
- VLCDs provide an average reduction of between 1.5 to 2.5 kg/ week

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The formulas of VLCD

- 14-18 g protein/packet, 70-90 g protein/day
- 50-60% of carbohydrate
- Essential fatty acids
- For 12-16 weeks

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VLCD product

- Optifast 800
 - 163 Cal/sachet
 - Caloric distribution: Protein 35%, Fat 17%, Carbohydrate 48%
 - Daily protein intake: 70g
 - Daily dosage: 5 sachet
- Optifast 450
 - 150 Cal/sachet
 - Caloric distribution: Protein 46%, Fat 14%, Carbohydrate 40%
 - Daily protein intake: 52g
 - Daily dosage: 3 sachet

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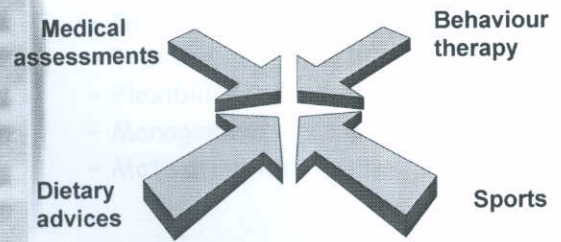
The formulas of VLCD

	Optifast (43.5 gm)
熱量	160
蛋白質(gm)(%)	11.9(29.8%)
脂肪(gm)(%)	3.8(21.4%)
醣類(gm)(%)	19.6(49%)
纖維(gm)	2.4

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Components of medical driven program



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Global experience sharing-Germany

- obese people BMI >30
and/or
- **existing disorders like hypertension**
- **some unsuccessful diet attempts in history**
- **no disorders like anorexia or bulimia**
- age >18
- treatment 52 weeks /1 meeting weekly
- reimbursement possible



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Structure

- 52 group meetings (weekly)
 - 1 week pre-investigations - medical and psychological assessment (EU)
 - 12 weeks modified fasting period with OPTIFAST 800
 - 6 weeks shifting period - reduction of OPTIFAST 800 with integration of energy reduced food
 - 33 weeks period of stabilisation and empowerment

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Program Contents

- Behaviour modification
 - continous coping strategies
 - strategies for counter-reactions
 - analysing of eating behaviour
 - eating disorders
 - self-acceptance
 - solution models for different problems
 - failure management

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Program Contents

- Dietary program
 - Principle of flexible control
 - Simplification in selection of food counting of fat and carbohydrate points instead of calories
 - Common cooking seminars
 - Training of restaurant visits
 - Training of shopping in supermarkets

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Program Contents

- Dietary benefits
 - simple handling
 - control of fat consumption, liberalisation of carbohydrate consumption
 - use of a new model of flexible control instead of rigid control
 - individualised dietary
 - great variation in meals

Program Contents

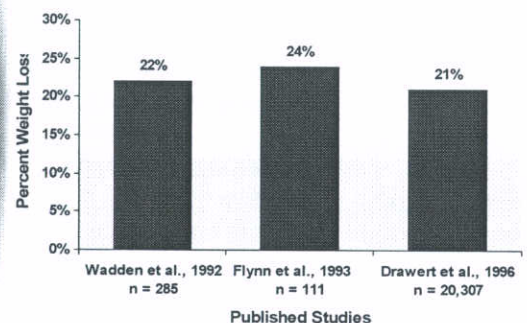
- Sports/Physical Activities
 - Early begin in week 3
 - Increasing of daily activities
 - Training in gymnastics
 - Flexibility in kind of sport
 - Management in case of failure
 - Motivation through success



- OPTIFAST II Short program
 - overweight people BMI 25-30
 - age >18
 - treatment 15 weeks /1 meeting weekly
 - no reimbursement
- OPTIFAST II Product excl. Program
 - within own programs
 - „offer for maintenance“

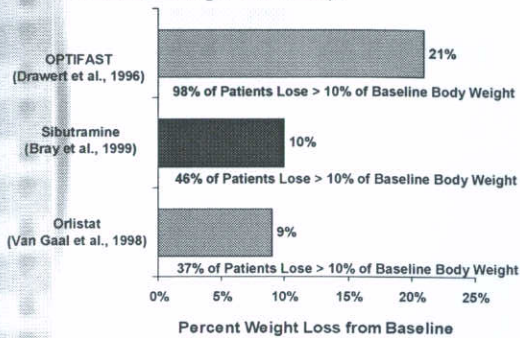
OPTIFAST平均減重效果

Average Weight Loss For Patients Completing at Least 22 Weeks of OPTIFAST® Treatment



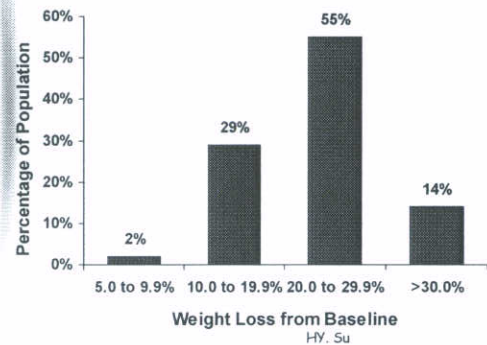
OPTIFAST與藥物減重成效比較

Average 22 to 24 Week Weight Loss with OPTIFAST® vs. Treatment with Sibutramine (30 mg dose daily) or Orlistat (120 mg 3 times daily)*



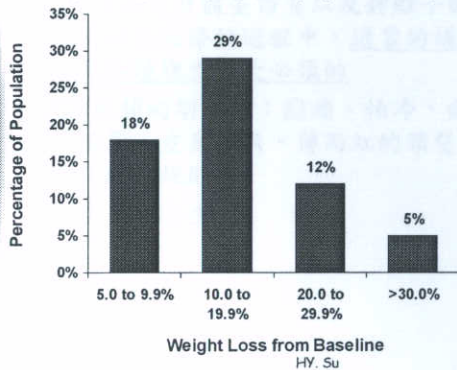
OPTIFAST減重效果分布

98%使用者使用後可減輕體重達10%以上
100%使用者使用後可減輕體重達5%以上



使用OPTIFAST兩年後體重維持狀況

46%使用者使用兩年後仍可維持10%以上的減重效果
64%使用者使用兩年後仍可維持5%以上的減重效果



糖尿病、高血壓、高膽固醇血症患者亦可使用

Patients With	Baseline				End of Intervention*			
	Weight (lbs)	Glucose (mg/dl)	Systolic/Diastolic (mmHg)	Cholesterol (mg/dl)	Weight (lbs)	Glucose (mg/dl)	Systolic/Diastolic (mmHg)	Cholesterol (mg/dl)
Diabetes (n = 1223)	257	170	141/84	224	207	120	128/77	201
Hypertension (n = 5996)	258	110	141/87	220	203	93	127/79	193
Hypercholesterolemia (n = 2926)	237	104	131/82	243	187	90	119/74	207

Source: Drawert et al., 1996.

*All significantly different (p<0.001) from baseline

VLCD臨床功效-短期

- VLCD平均減輕體重
 - 第一週平均體重降低0.78公斤/天
 - 第三週平均體重降低0.28公斤/天
- VLCD在使用初期體重快速降低，主要導因
 - 利尿作用
 - 鈉離子損失
- VLCD能有效降低血膽固醇與三酸甘油酯、改善血糖耐受性、第2型糖尿病患者血糖

VLCD re-entry to regular food

- Refeeding takes 4-6 weeks but depends on the patient.
- The patient might reduce one packed of formula/day, replacing it with 2-3 oz of white meat chicken and 1/2 cup of steamed vegetables.
- Calories are increased by 100-150 kcal/day.
- Eventually, as the stomach adapts to regular food, salads and other raw vegetables, as well as seasonings, are reintroduced.

VLCD臨床功效-長期

- 平均中輟率55%
- 完成整個計畫者，有復胖情形發生
- 同時併用他種治療方法
 - 營養照會
 - 強化運動
 - 放鬆技巧
 - 行為治療

VLCD臨床功效-長期

- VLCD合併行為修正6個月
 - 一年後，體重僅增加2.1公斤
- 行為治療訓練的減重者能有效的維持所降低的體重
- 運動雖無法證實在體重的降低上有顯著的好處
 - 運動組減輕的體重有較高的脂肪

VLCD臨床使用時的應注意事項

- VLCD會造成身體蛋白質以及鉀離子的喪失，所以在治療的過程中，適當的補充鈉、鉀以及各種維生素是必須的
- VLCD有關的副作用：癲癇、怕冷、疲倦感、頭暈、皮膚乾燥、薄而紅的頭髮、貧血以及月經不規則等
- 肝膽疾病的發生

使用VLCD需注意

- 心臟病或有心臟疾病史
- 有系統性疾病表現
- 有精神或情緒疾病史
- 接受慢性藥物治療(胰島素、降血糖藥物、抗發炎藥物、精神病藥物等)

使用極低熱量飲食絕對禁忌

- 惡性心律不整
- 不穩定心絞痛
- 蛋白質損耗性疾病(SLE, Cushing disease)
- 主要系統衰竭(肝衰竭, 腎衰竭)
- 藥物治療導致蛋白質損耗(類固醇, 抗癌藥物)
- 懷孕或哺乳
- 體重並未高於標準體重20%以上(BMI<25)

使用極低熱量飲食相對禁忌

- 鬱血性心臟病
- 以鉀離子損耗性利尿劑治療
- 腎上腺刺激性藥物
- 藥物醫囑性差
- 體重並未高於標準體重30%(BMI<30)
- 藥物濫用

使用VLCD的時機

- 中度至重度肥胖(BMI \geq 30)，具有強烈減重動機者
- 曾經嘗試多種保守的減重方法後仍失敗者
- 經由快速減重能立刻改善病人的病況者，包括控制不良的第2型糖尿病、高三酸甘油酯血症、阻塞性睡眠中止症等

使用VLCD的監測

- 其執行應在醫師、營養師以及行為治療師等專家團隊的監控下進行12到16週
- 執行前應審慎評估
 - 參與減重者的健康情形
 - 是否存有使用上的禁忌症
 - 完整的評估包括身體檢查、抽血檢驗以及心電圖、超音波等，並詳細告知參與者可能發生的危險性

Thanks for your attention !