

# Preoperative nutrition counseling

## *More than weight loss*

(Präoperative Ernährungsberatung: mehr als Gewichtsreduktion)

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# Quick survey

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Who recommends special Pre-OP Diets ?

Who is for it?

Who is against it ?



# Preoperative important aspects

- Getting to know the patient – building rapport/trust.
- Evaluate and improve his knowledge about a healthy and balanced diet
- Education about a healthy eating behaviour (EB) is always an integral part of the preparation for surgery
- Start practicing behaviour change



"I'm going to order a broiled skinless chicken breast,  
but I want you to bring me lasagna and  
garlic bread by mistake."



# Preoperative dietary interventions

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- Healthy lower calories balanced diet + Eating Behaviour (EB)
- Very-low-calorie diet (VLCD) + EB
- Very-low-calorie diet (VLCD) with meal replacement (MR) + EB

# Small overview preoperative diets in Swiss hospitals

	Healthy lower calories	VLCD	VLCD+ MR	BMI	Time/wks	Purpose
<b>German CH</b> Most Some Exceptions	Yes	Yes Yes No	Yes No No	N.A./>50	2-4 6-8	- ↓ Liver Risks - Check Motivation - Facilitate & reduce duration of surgery
<b>French CH</b>	Yes	No	Yes	All	Individual	
<b>Italian CH</b>	Yes	No	No	All	Individual	

Bariatric Fachgruppe SVDE Survey

# Healthy lower calories balanced diet

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## Definition

Balanced diet: 45-55% carbs, 20-35% fat, 15% protein

Kcal: Energy requirement – 500 kcal/d

## Indication

- Every patient undergoing bariatric surgery



# Healthy lower calories balanced diet

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## Purpose

To practice eating ...

- *balanced meals*
- *follow a healthy eating behaviour:*
  - *Regular balanced meals*
  - *eating slowly*
  - *chewing food properly*
  - *listening to body cues of hunger/fullness*
  - *not eating as a coping mechanism*
  - *...*

## Benefits

- Weight stabilisation/loss pre-operatively
- Stabilisation of blood sugar/improved recovery/lower risks of complications
- Preparing for a lifestyle change

# Very-low-calorie diet (VLCD)

## Definition

≤ 800 Kcal/d

Strong reduction of carbs

Duration: 2-4 weeks



## Indication

- NAFLD/NASH
- ↑ Abdominal adiposity
- ↑BMI – for rapid weight loss

# Very-low-calorie diet (VLCD)

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## Purpose

- ↓ liver volume
- ↓ body weight
- ↓ visceral adipose tissue (VAT) and subcutaneous adipose tissues (SAT)

## Benefits

- ↓ surgical difficulty
- ↓ risk of liver trauma and blood loss
- ↑ insulin sensitivity and improve blood sugar at surgery

# Very-low-calorie diet (VLCD) with meal replacements (MR)

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**Definition (same as VLCD)**

400-800 Kcal/d from meal replacements

Strong reduction of carbs

Duration: 2-4 weeks

**Indication**

- NAFLD/NASH
- ↑ abdominal adiposity
- ↑ BMI – for rapid weight loss



# Very-low-calorie diet (VLCD) with meal replacements (MR)

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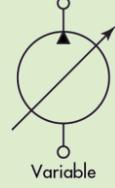
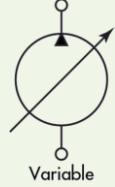
## Purpose (same as VLCD)

- ↓ liver volume
- ↓ body weight
- ↓ VAT and SAT

## Benefits

- ↓ surgical difficulty
- ↓ risk of liver trauma and blood loss
- ↑ insulin sensitivity and improve blood sugar at surgery

# Differences between pre-OP Diets?

Diets	Body Weight	Liver volume	Compliance	Acceptance	Composition
Healthy lower calories diet	↓	↖	😐	😐	 Variable
VLCD	↓	↓↓	😐	😊	 Variable
VLCD with MR	↓	↓↓	😊	😊	 Fixed

# Example of VLCD with MR

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SL Colles, et. al. **Preoperative weight loss with a very-low-energy diet (VLED): quantitation of changes in liver and abdominal fat by serial imaging.** Am J Clin Nutr 2006;84:304-11.

## Objective:

- Investigate the efficacy and acceptability of a pre-op VLED
- Measure changes in: liver volume, body weight, VAT, SAT (week 2, 4, 8, 12)

Design	Men	Women
N = 32	19	13
Age	47.5 ± 8.3	47.5 ± 8.3

# Diet

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Duration: 12 Weeks

Product: Optifast 3/day

456 Kcal, 52 g protein, 7 g fat, 45 g carbs

+ 250 g veggies (low starchy)

Total energy: 456-680 Kcal

Beverages: 2 L water, or kcal-free

No re-feeding period – (Post OP progression diet)

# Tests

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**Computed Tomography (CT scan):**

Liver, VAT, SAT

**Magnetic resonance imaging (MRI):**

Liver, VAT

**Dietary Compliance:**

Urinary ketones (Keto-Diastix, Bayer)

**Labs:**

AST, ALT, lipid profile, glucose, insulin, A1C, CRP

**Qualitative assessment for acceptability(likert scale):**

Product acceptability, hunger, nausea/vomiting, bowel function, constipation, emotional eating, social eating

# Results

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**TABLE 1**  
Descriptive characteristics of subjects before and after a 12-wk very-low-energy diet<sup>1</sup>

Characteristic	Baseline	After 12 wk	Mean change <sup>2</sup> %
Body weight (kg)	139.8 ± 11.0 <sup>3</sup>	125.0 ± 11.7	-10.6 (-0.7 to -19.1)
BMI (kg/m <sup>2</sup> )	47.3 ± 5.3	42.3 ± 5.5	-10.6 (-0.7 to -19.1)
Waist circumference (cm)	140.8 ± 9.8	128.1 ± 10.0	-9.0 (0 to -19.2)
Neck circumference (cm)	45.9 ± 3.8	43.2 ± 3.2	-5.9 (2.1 to -15.3)
Systolic BP (mm Hg)	154.3 ± 18.3	136.0 ± 18.1	-11.08 (13 to -37)
Diastolic BP (mm Hg)	90.7 ± 9.8	80.9 ± 11.2	-10.24 (22 to -34)
Liver volume (L)	2.8 ± 0.5	2.3 ± 0.4	-18.7 (20 to -51.6)
I2–3 VAT area (cm <sup>2</sup> )	346.3 ± 103.3	285.1 ± 89.3	-16.9 (11.8 to -52.6)
I2–3 SAT area (cm <sup>2</sup> ) <sup>4</sup>	454.5 ± 114.8	375.7 ± 109.7	-17.7 (2.9 to -40)

<sup>1</sup> n = 32 paired results. A significant liver volume reduction of 0.5 L (1 SD) was achieved by 15 subjects (47%). Eleven of the 15 subjects had a baseline liver volume > 2.8 g/L at baseline. Six of the 15 subjects achieved a reduction of 1.0 L (2 SD), all of whom had a baseline liver volume > 2.8 g/L. BP, blood pressure; VAT, visceral adipose tissue; SAT, subcutaneous adipose tissue.

<sup>2</sup> All values are  $\bar{x}$ ; range in parentheses. All changes are statistically significant,  $P < 0.001$  (paired-samples t test).

<sup>3</sup>  $\bar{x} \pm$  SD (all such values).

<sup>4</sup> n = 18.



# Results

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COLLES ET AL

TABLE 2

Changes in measures of glucose metabolism, lipids, liver function, and a marker of inflammation before and after a 12-wk very-low-energy diet<sup>1</sup>

Characteristic	Baseline	After 12 wk	P <sup>2</sup>
ALP (U/L)	93.2 ± 31.4 (59–211) <sup>3</sup>	84.5 ± 24.2 (52–159)	0.001
AST (U/L)	27.4 ± 12.7 (14–73)	24.8 ± 11.3 (11–59)	NS
ALT (U/L)	40.6 ± 23.6 (11–121)	32.8 ± 18.1 (9–105)	0.05
GGT (U/L) <sup>4</sup>	38.0 ± 39.0 (16–259)	30.0 ± 21.0 (10–227)	<0.001
Bilirubin (μmol/L)	11.1 ± 6.5 (4–30)	13.0 ± 8.3 (6–45)	0.011
Fasting glucose (mmol/L)	7.6 ± 3.4 (4.5–17.2)	6.1 ± 11.7 (3.8–16.4)	0.011
Fasting insulin (mIU/L) <sup>4,5</sup>	24.0 ± 15.0 (11–164)	17.0 ± 13.0 (7–85)	<0.001
Glycated hemoglobin A <sub>1c</sub> (%)	7.2 ± 1.8 (5.6–12.7)	6.3 ± 1.1 (5–9.6)	<0.001
Cholesterol (mmol/L)	5.0 ± 0.95 (3–6.8)	4.5 ± 1.2 (2.4–6.5)	<0.001
Triacylglycerol (mmol/L) <sup>3</sup>	1.8 ± 0.68 (0.8–3.1)	1.5 ± 0.69 (1–3)	0.043
HDL cholesterol (mmol/L)	1.3 ± 0.29 (0.8–2.3)	1.3 ± 0.25 (0.8–2.0)	NS
LDL cholesterol (mmol/L)	2.9 ± 0.87 (1.1–4.7)	2.5 ± 1.0 (0.8–4.5)	0.001
CRP (mg/L)	11.4 ± 9.6 (3–39.1)	10.8 ± 10.0 (1–43.6)	NS

<sup>1</sup> n = 31 paired results. ALP, alanine phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; GGT, γ glutamyltransferase; CRP, C-reactive protein.

<sup>2</sup> Paired-samples t test.

<sup>3</sup>  $\bar{x} \pm SD$ ; range in parentheses (all such values).

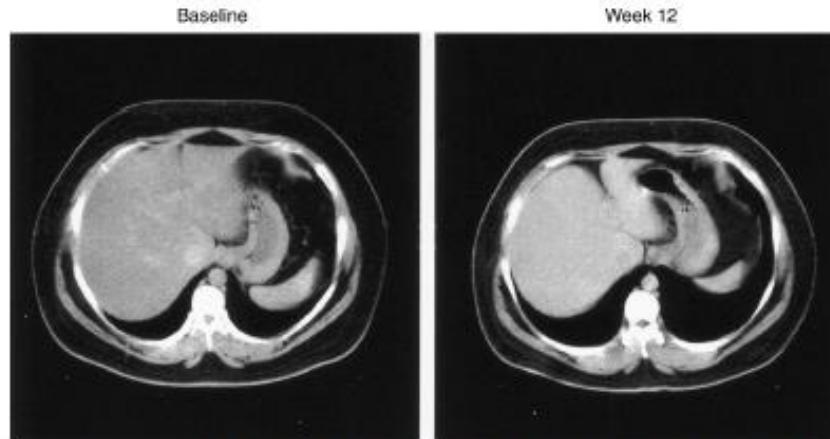
<sup>4</sup> Denotes log-transformed data for nonnormal distribution. Data presented are median ± interquartile range (range).

<sup>5</sup> Denotes data for which one outlying variable has been removed and excluded from all subsequent calculations.



# Liver CT Scans

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**FIGURE 1.** Single cross-sectional images of the liver performed by computed tomography at baseline and week 12 of a very-low-energy diet. The images, taken from within a series of contiguous 8-mm slices used to calculate total liver volume, illustrate the extent of the change in liver volume with weight loss in a 35-y-old man with an initial liver volume of 3.7 L and a final liver volume of 2.4 L. A 35% reduction in liver size and a weight loss of 18 kg were observed.

# Authors conclusions implications for practice

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- 80% liver reduction within 1st 2 Weeks ( $P<0.001$ )
- Average of – 1.3 Liters liver volume reduction

## When is a VLED recommended?

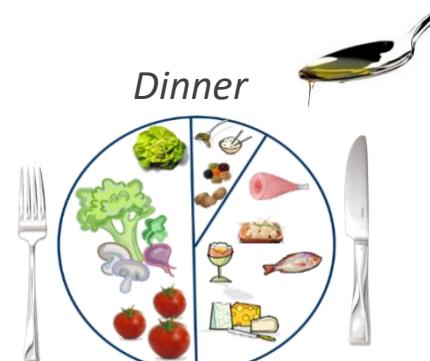
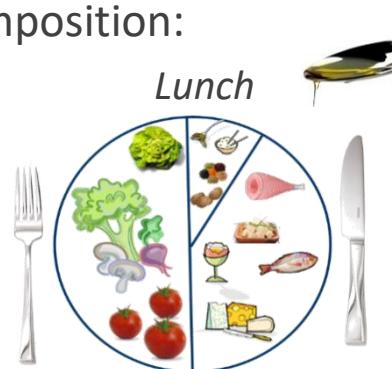
- For NAFLD/NASH ~ 2-3 Wks
- For VAT/SAT > 2 Wks
- Very high BMIs

# Pre-OP diet

## Stadtspital Triemli Zürich

### Nutritional Concept

- Duration: 2 – max. 3 weeks
- Daily calories: 800kcal
- Macronutrients:
  - 60 g Protein/d (30%)
  - 25 g Fat/d, incl. 2g Omega-3 (30%)
  - < 80 g Carbs/d (40%)
- Micronutrients: daily supplementation
- Meal's Structure and composition:



### Criteria:

- BMI > 40 kg/m<sup>2</sup>
- Steatosis
- Improve blood sugar
- Evaluation patient's compliance

# Pre-OP diet

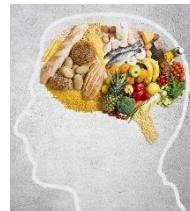
## Stadtspital Triemli Zürich

### Pros

- Simple concept
- Short duration
- Multi-effects: medical and educational
- Very similar concept for post-OP
- No costs for MR

### Cons

- Need discipline
- Need motivation to buy and prepare the right foods
- Variability of the meal's composition
- Cost of healthier Food



# Pre-OP diet

## Luzerner Kantonsspital

**Nutritional concept: > BMI 55**

**Duration: 2 Phases**

- a. 4 Wks HLCD (1000-1200 Kcal)
- b. 2-3 wks VLCD with MR

**3 shakes 654 Kcal    4 Shakes 870 Kcal**

87 g CHO                      116 g CHO

42 g Prot                      56 g Prot

14.4 g Fat                      20 g Fat

- Product: Optifast or Modifast
- Micronutrients: > 100% RDV

**Meal replacements**



# Pre-OP diet

## Luzerner Kantonsspital

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### Pros

Easy to follow

'Standard' macro/micro

Short duration

No need to cook much

Quick results

Good compliance

### Cons

Costs

Acceptability (?)

Restrictive

# Case report LUKS

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43 Yrs. Man

BMI 76.3 (250 Kg, 181 cm)

1st Surgery Attempt 'unsuccessful'



**Referred to LUKS**

- Monthly Dietitian visits
- Portion Control, Kcal-reduction, Pre-OP Diet
- 5 Months: - 20 Kg (mostly abdominal)

(11 Kg Conservative Therapy over 4 Months, then 9 Kg in 17 Days through MR)

- BMI at Surgery: 70.3 Kg/m<sup>2</sup>

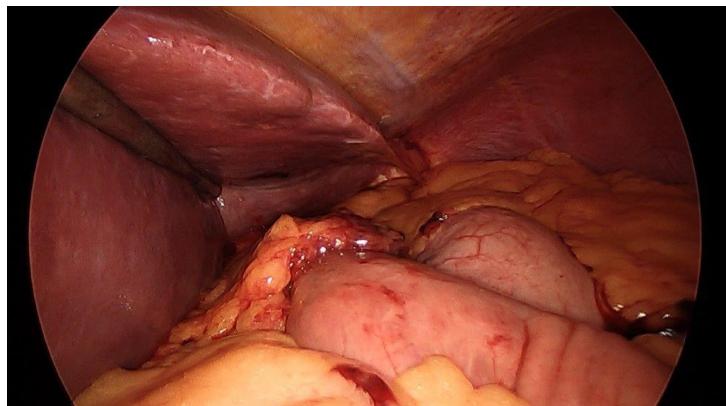
# Liver images



BMI 70, Pre-OP diet with MR,  
'slim' liver. Easy to operate.  
BMI reduced to 60.9 kg/m<sup>2</sup>



BMI 50.5 kg/m<sup>2</sup> No Pre-OP diet.  
Enlarged liver but still operable.



(BMI 35.8 , no diet



Fatty Liver BMI 50.8 kg/m<sup>2</sup>, no diet

# Take Home Message

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## Facts

- After 2 weeks VLCD with/without MR a max. liver reduction is achieved
- May facilitate Surgery
- Improve patient's knowledge (educational aspect) / well accepted

## Where do we stand?

- All hospital prepare patients with a healthy/lower calories diet
- No consensus among surgeons nor dietitians
- No standard diet protocols / No SMOB Guidelines

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# Thank You for your attention

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The discussion is open...

