Endokrinologie/Diabetologie-Kolloquium
15.03.2023

# Management der Adipositas:
# Lifestyle – Medikamente - Chirurgie

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OAZ OSTSCHWEIZER ADIPOSITASZENTRUM

# Obesity: a chronic relapsing progressive disease process.

A position statement of the World Obesity Federation

**„Obesogenic Environment“:** komplexe Interaktionen Lebensstil (hochkalorische Nahrung, Bewegungsmangel) – Umwelt – (epi-)genetische Faktoren;
Funktion des neuroendokrinen Systems gestört

*Obesity Reviews 2017;18:715-23*

# Definition und Klassifikation der Adipositas

Definition: = Fettleibigkeit = Vermehrung des Körperfett

Klassifikation: BMI, Taillenumfang

Weitere Abklärungen: Anamnese / Status / Labor
Co-Morbiditäten?

*Obes Facts 2015; 8:402-24; Obes Facts 2019; 12:40-66*

# Therapieziele

- Nicht nur Gewichtsreduktion!
- Gewicht / BMI nicht so wichtig wie Bauchumfang / body composition: Erhaltung der fettfreien Masse, Reduktion der Fettmasse

  Cave: "sarkopene Adipositas"
- Komplikationen verhindern
- Verbesserung von Co-Morbiditäten
- Verbesserung der Lebensqualität und des Wohlbefindens
- Weitere Gewichtszunahme / -wiederzunahme verhindern

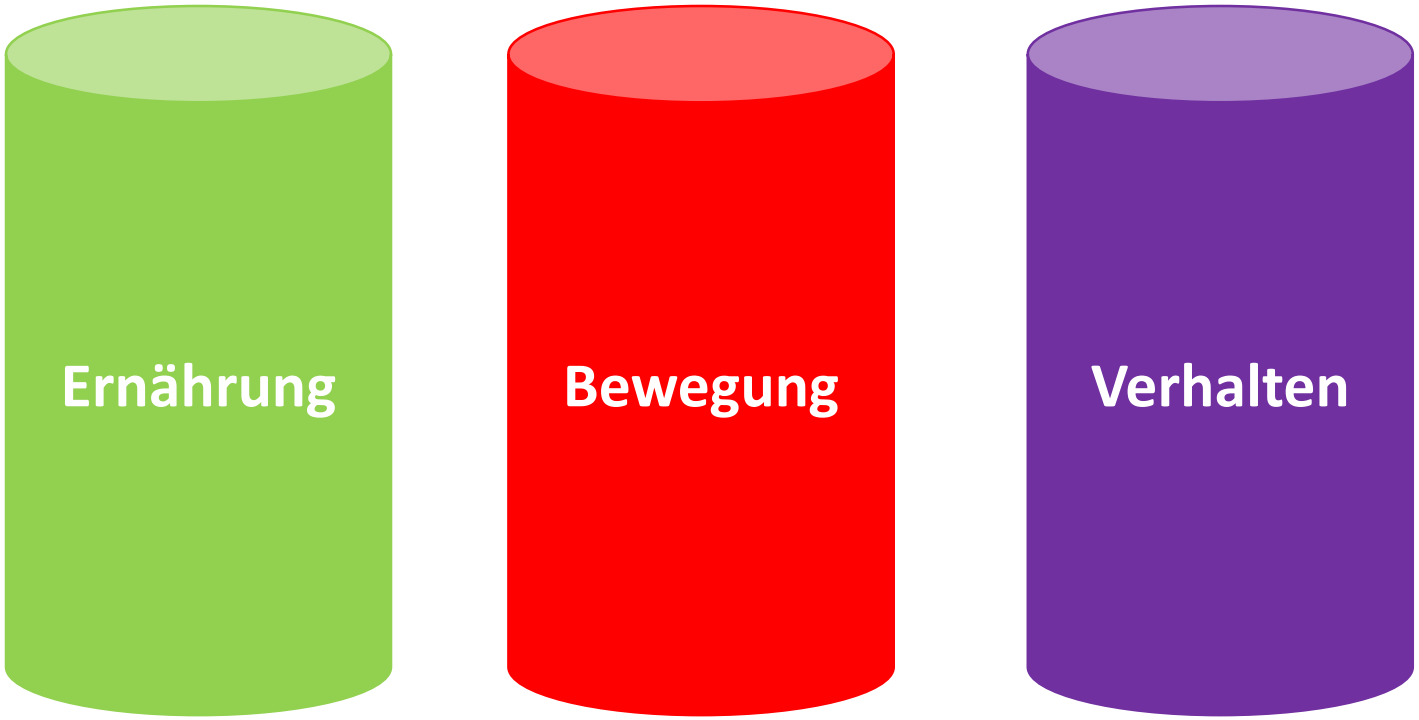
*Obes Facts 2015; 8:402-24; Obes Facts 2019; 12:40-66*

Geringe Gewichtsreduktionen (5%) führen zu relevanten Verbesserungen

Stärkere Gewichtsreduktionen führen zu stärkeren Verbesserungen

*Obesity 2014; 22:suppl2: S41-410*

# Konservative Adipositastherapie: 3 Säulen - Lebenstilintervention



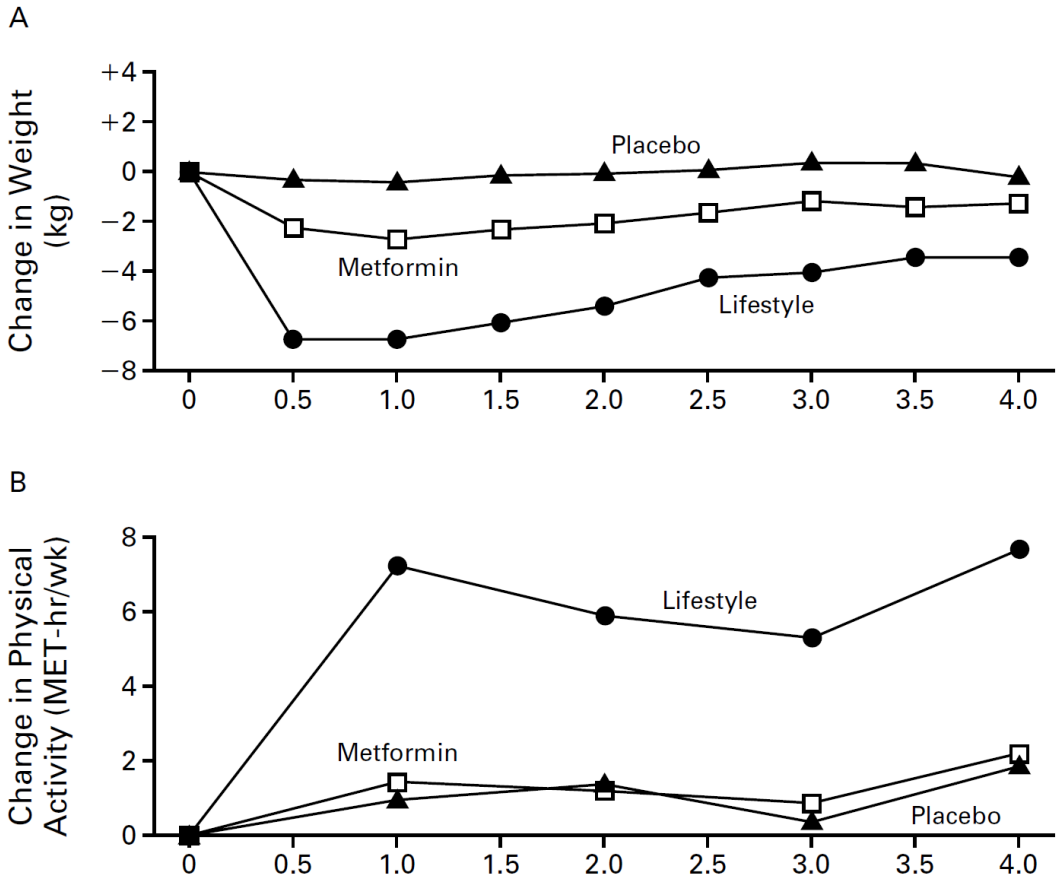
# Lifestyle-Intervention

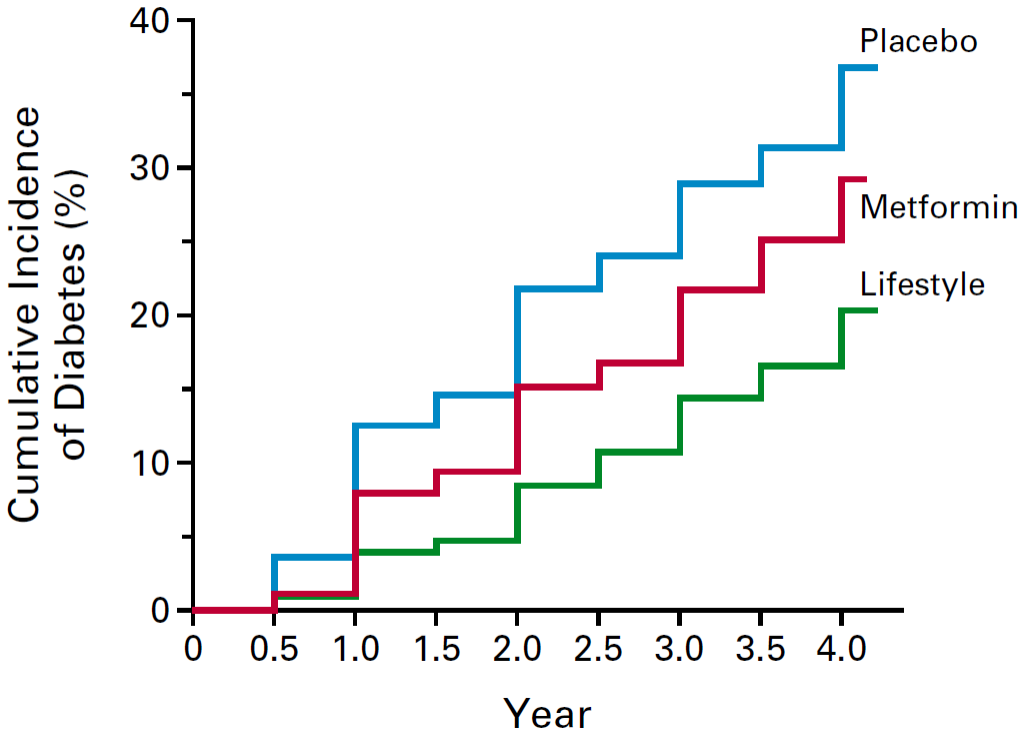
- **Kalorienreduzierte Diät**
  - Energiedefizit ≥ 500kcal/d; oft 1200-1500 kcal/d für Frauen, 1500-1800 kcal/d für Männer
- **Gesteigerte körperliche Aktivität**
  - z.B. forciertes Gehen ≥ 150min/Woche; 200-300min/Woche um das Gewicht zu halten bzw. um sek. Zunahme zu minimieren (> 1 Jahr)
- **Verhaltenstherapie**
  - Strukturiertes Verhaltenstherapieprogramm
  - Regelmässige Selbstbeobachtung der Nahrungsaufnahme, der körperlichen Aktivität und des Gewichts - Achtsamkeit

*Obesity 2014; 22:suppl2: S41-410; Obes Facts 2015; 8:402-24; Obes Facts 2019; 12:40-66*

# REDUCTION IN THE INCIDENCE OF TYPE 2 DIABETES WITH LIFESTYLE INTERVENTION OR METFORMIN

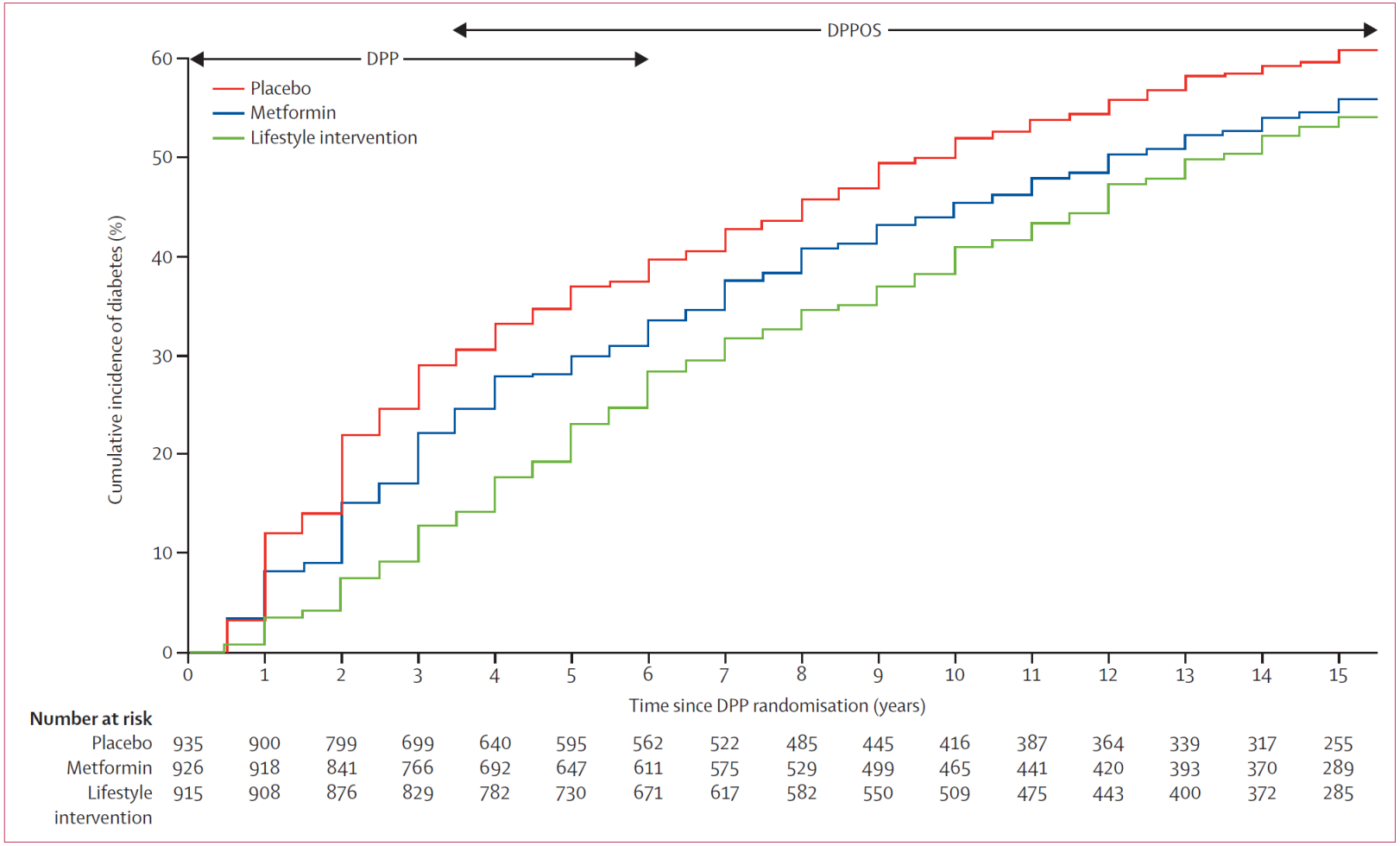
DIABETES PREVENTION PROGRAM RESEARCH GROUP*




*NEJM 2002;346:393-403*

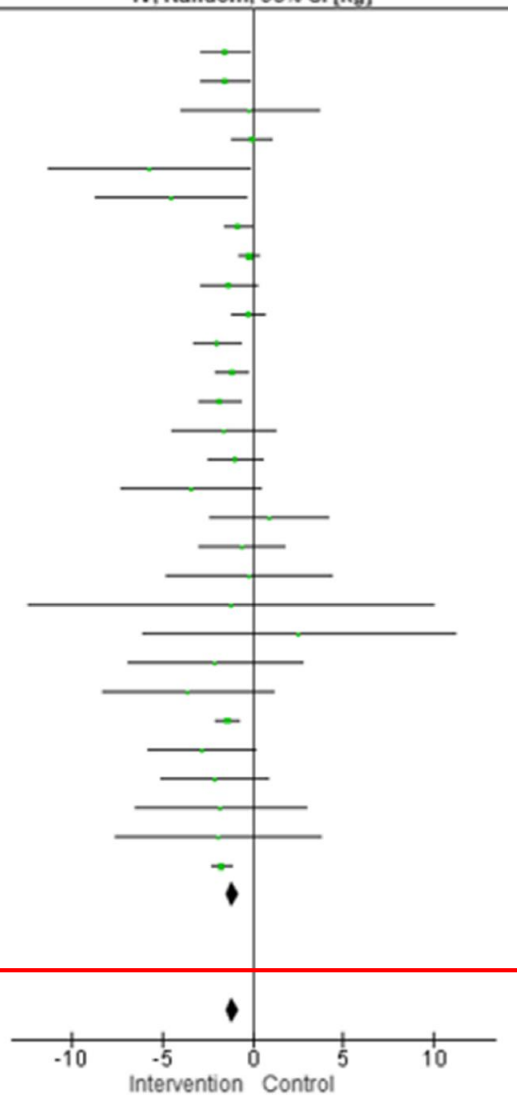
# Long-term effects of lifestyle intervention or metformin on diabetes development and microvascular complications over 15-year follow-up: the Diabetes Prevention Program Outcomes Study




*Lancet Diabetes Endocrinol 2015;3:866-75*

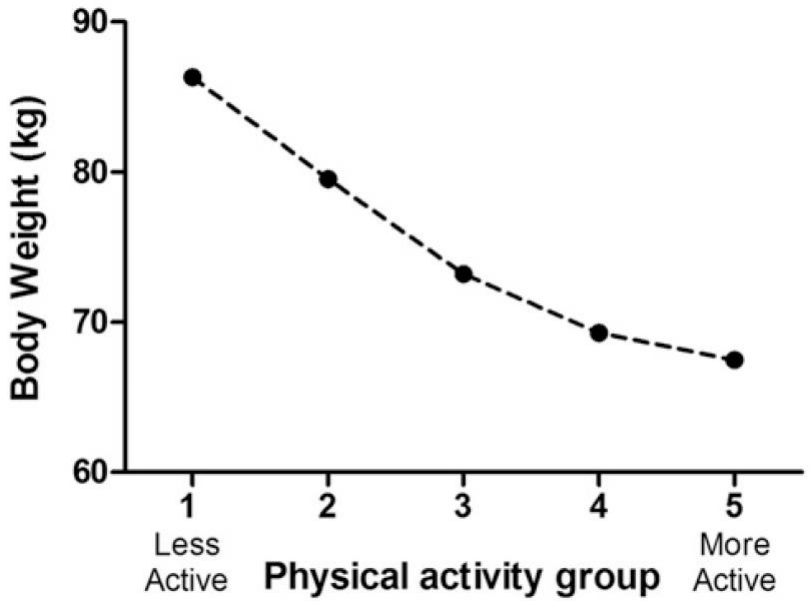
# Preventing weight gain in adults: systematic review and meta-analysis of RCTs

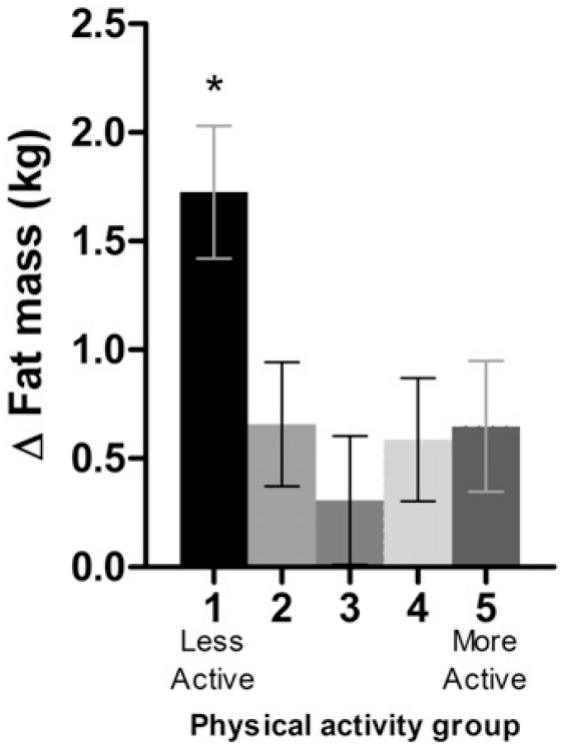
| Study or Subgroup | Intervention Mean [kg] | Intervention SD [kg] | Intervention Total | Control Mean [kg] | Control SD [kg] | Control Total | Weight | Mean Difference IV, Random, 95% CI [kg] |
|---|---|---|---|---|---|---|---|---|
| **2.1.1 Weight change (all participants)** | | | | | | | | |
| Bennett 2013 | -1 | 4.77 | 91 | 0.5 | 4.85 | 94 | 4.4% | -1.50 [-2.89, -0.11] |
| Bertz 2015 | -0.47 | 3.66 | 67 | 1.08 | 4.38 | 68 | 4.5% | -1.55 [-2.91, -0.19] |
| Chang 2010 | 85.18 | 5.64 | 12 | 85.35 | 5.54 | 26 | 0.8% | -0.17 [-4.01, 3.67] |
| Chang 2017 | 85.49 | 4.95 | 219 | 85.51 | 4.93 | 124 | 6.0% | -0.02 [-1.11, 1.07] |
| Donnelly 2003 | 81.97 | 12.76 | 41 | 87.71 | 11.56 | 33 | 0.4% | -5.74 [-11.29, -0.19] |
| Eiben 2006 | -1.9 | 6.78 | 18 | 2.6 | 6.57 | 22 | 0.7% | -4.50 [-8.67, -0.33] |
| Forster 1988 | -0.95 | 2.74 | 103 | -0.14 | 2.81 | 108 | 8.7% | -0.81 [-1.56, -0.06] |
| Gow 2010 | 0.31 | 1.43 | 119 | 0.47 | 1.56 | 40 | 10.7% | -0.16 [-0.71, 0.39] |
| Hivert 2007 | -0.6 | 3.46 | 48 | 0.7 | 4.16 | 48 | 3.8% | -1.30 [-2.83, 0.23] |
| Jeffery 1999 | 1.55 | 7.01 | 395 | 1.8 | 6.1 | 414 | 7.4% | -0.25 [-1.16, 0.66] |
| Katterman 2014 | -1.5 | 2.75 | 26 | 0.48 | 1.9 | 25 | 4.9% | -1.98 [-3.27, -0.69] |
| Klem 2000 | -1.36 | 2.02 | 34 | -0.2 | 1.3 | 21 | 7.6% | -1.16 [-2.04, -0.28] |
| Leermakers 1998 | -1.63 | 2.52 | 44 | 0.22 | 1.9 | 18 | 5.6% | -1.85 [-3.00, -0.70] |
| Lemon 2014 | 78.3 | 18.9 | 354 | 79.9 | 18.1 | 286 | 1.3% | -1.60 [-4.48, 1.28] |
| Levine 2007 | -0.18 | 4.57 | 147 | 0.8 | 5.8 | 75 | 3.9% | -0.98 [-2.49, 0.53] |
| Lombard 2010 | 72.14 | 13.63 | 109 | 75.51 | 15.24 | 106 | 0.8% | -3.37 [-7.24, 0.50] |
| Lombard 2016 | 77.51 | 18.06 | 259 | 76.6 | 18.85 | 233 | 1.1% | 0.91 [-2.36, 4.18] |
| Lytle 2017 | 73.8 | 11.72 | 187 | 74.4 | 11.55 | 179 | 1.9% | -0.60 [-2.98, 1.78] |
| Mason 2018 | 79.95 | 18.96 | 132 | 80.16 | 18.77 | 134 | 0.6% | -0.21 [-4.74, 4.32] |
| Matvienko 2001 | 67.7 | 13.6 | 18 | 68.9 | 18.4 | 15 | 0.1% | -1.20 [-12.43, 10.03] |
| Medina 2018 | 73.16 | 19.63 | 28 | 70.62 | 11.01 | 22 | 0.2% | 2.54 [-6.06, 11.14] |
| Metzgar 2016 | 75.15 | 8.3 | 55 | 77.2 | 11 | 25 | 0.5% | -2.05 [-6.89, 2.79] |
| Middleton 2014 | 66.81 | 11.65 | 47 | 70.39 | 11.92 | 48 | 0.5% | -3.58 [-8.32, 1.16] |
| Nikolaou 2015 | 65.5 | 13.01 | 3867 | 66.9 | 13.2 | 2134 | 9.3% | -1.40 [-2.09, -0.71] |
| Partridge 2016 | 76 | 10.7 | 115 | 78.8 | 12.6 | 125 | 1.3% | -2.80 [-5.75, 0.15] |
| Verweij 2012 | 84.9 | 16.1 | 233 | 87 | 16.1 | 223 | 1.3% | -2.10 [-5.06, 0.86] |
| Williams 2014 | 65.6 | 8.5 | 22 | 67.4 | 6.7 | 18 | 0.5% | -1.80 [-6.51, 2.91] |
| Williams 2019 | 66.4 | 8.7 | 16 | 68.3 | 7.2 | 14 | 0.4% | -1.90 [-7.59, 3.79] |
| Wing 2016 | -1.47 | 2.62 | 251 | 0.26 | 2.59 | 139 | 10.8% | -1.73 [-2.27, -1.19] |
| **Subtotal (95% CI)** | | | **7057** | | | **4817** | **100.0%** | **-1.15 [-1.50, -0.80]** |
| Heterogeneity: Tau² = 0.22; Chi² = 41.67, df = 28 (P = 0.05); I² = 33% | | | | | | | | |
| Test for overall effect: Z = 6.44 (P < 0.00001) | | | | | | | | |
| **Total (95% CI)** | | | **7057** | | | **4817** | **100.0%** | **-1.15 [-1.50, -0.80]** |




*Obesity Reviews 2021;22:e13280*

# Low levels of physical activity are associated with dysregulation of energy intake and fat mass gain over 1 year



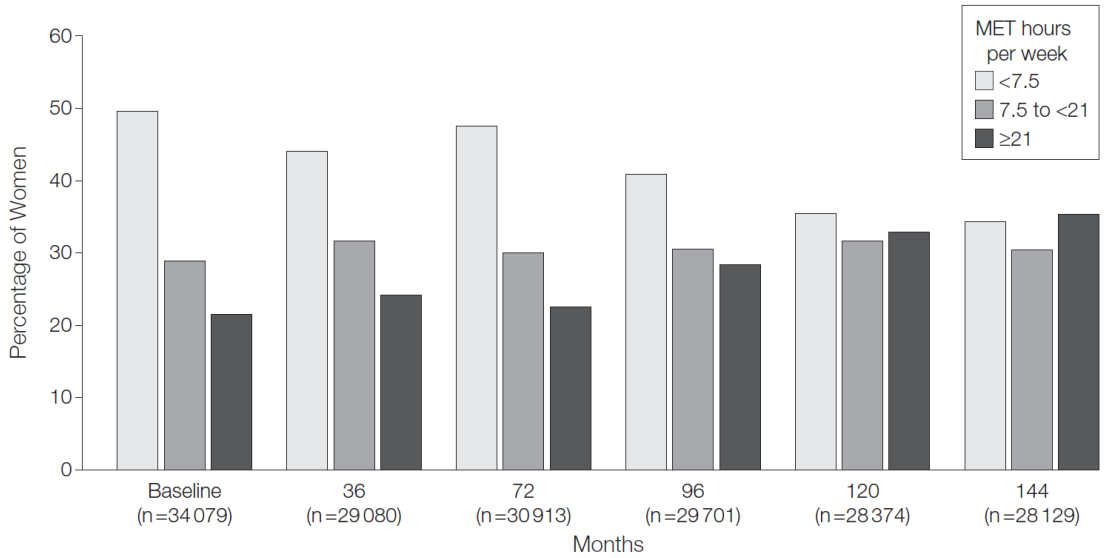



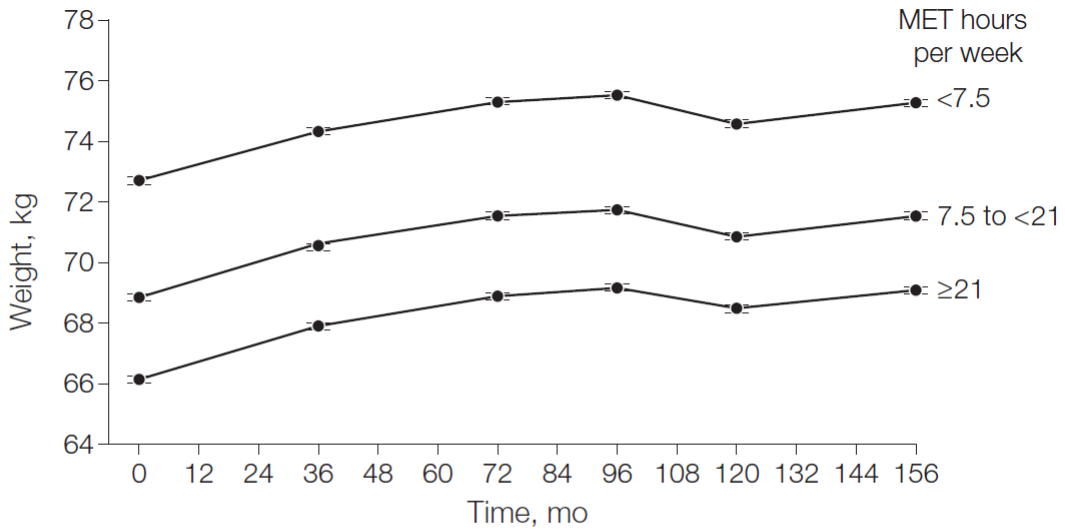

*AJCN 2015;102:1332-8*

# Physical Activity and Weight Gain Prevention

Women's Health Study: 34 079 healthy US women (mean age, 54.2 years) from 1992-2007

**Figure 1.** Physical Activity Levels Throughout Women's Health Study

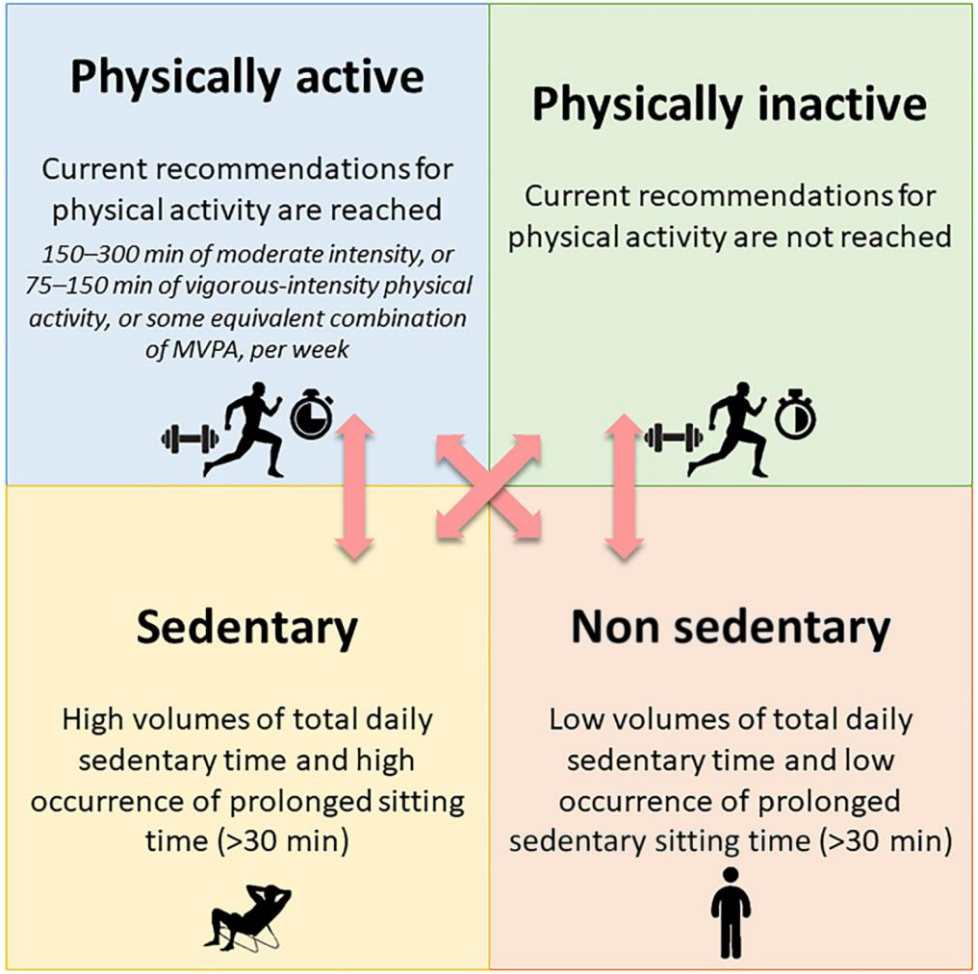


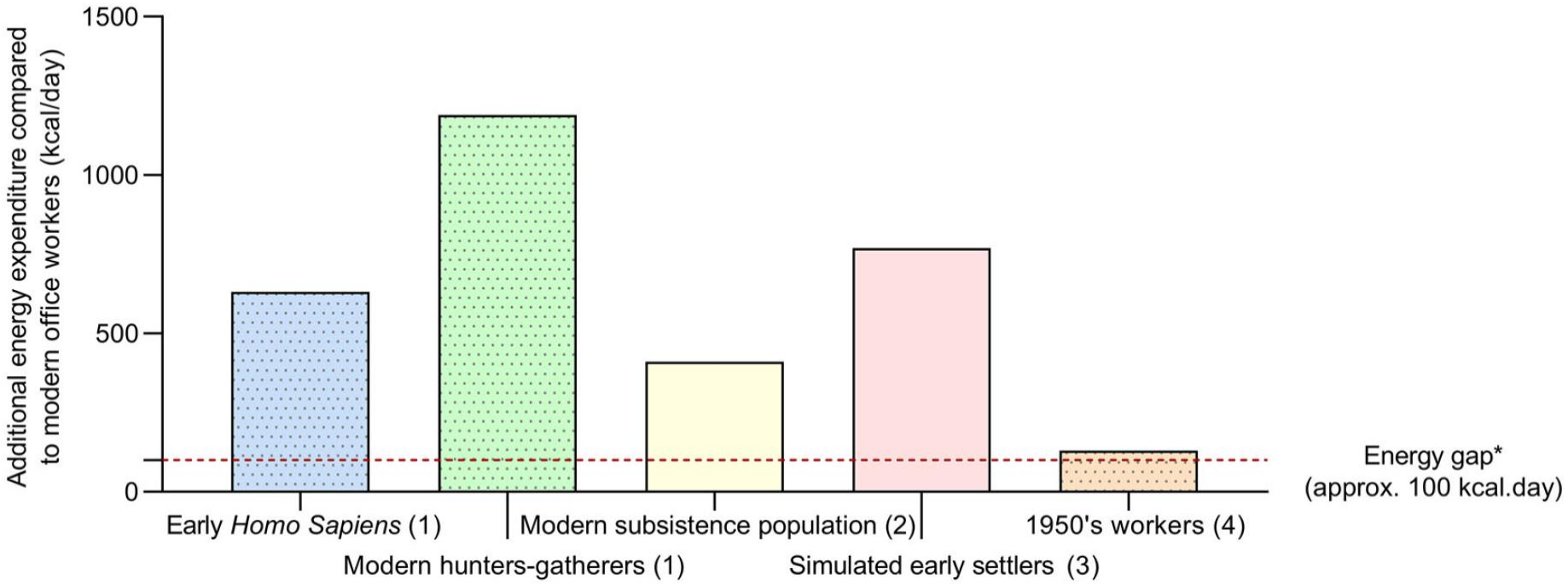

| No. by MET hours per week | | | | | | |
|---|---|---|---|---|---|---|
| <7.5 | 16 856 | 15 634 | 15 153 | 15 661 | 13 779 | 13 353 |
| 7.5 to <21 | 9819 | 9171 | 9005 | 9260 | 8336 | 8106 |
| ≥21 | 7404 | 6924 | 6808 | 6992 | 6264 | 6107 |

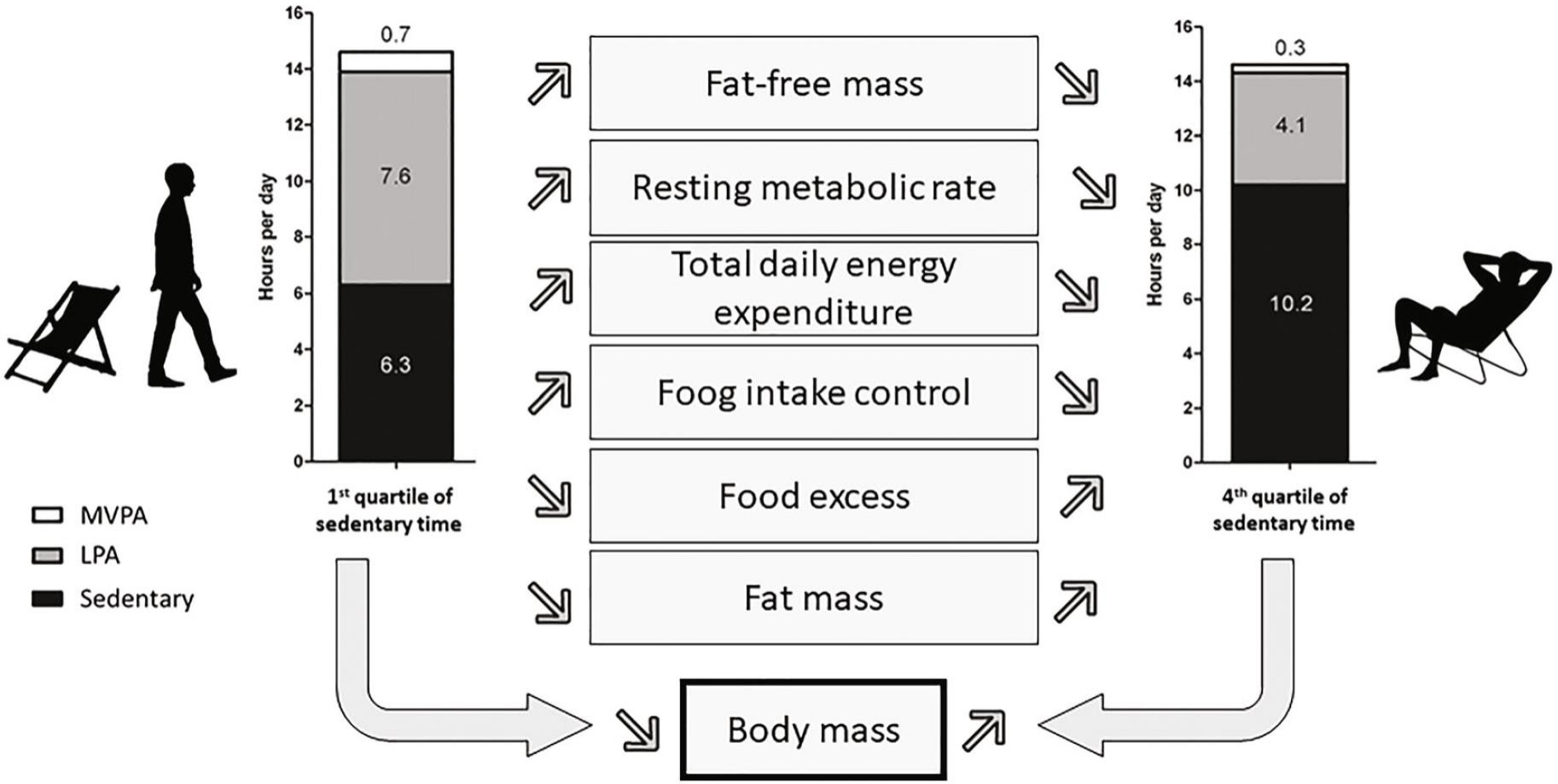
*JAMA 2010;303:1173-9*

# The role of physical activity in the regulation of body weight: The overlooked contribution of light physical activity and sedentary behaviors




*Obesity Reviews 2023;24:e13528*


Additional energy expenditure compared to modern office workers (kcal/day)
1500
1000
500
0
Energy gap*
(approx. 100 kcal.day)
Early *Homo Sapiens* (1)
Modern subsistence population (2)
1950's workers (4)
Modern hunters-gatherers (1)
Simulated early settlers (3)




*Obesity Reviews 2023;24:e13528*

# Regelmässige körperliche Aktivität……

- Gesamtmortalität
- Kardiovaskuläre Mortalität
- Kardiovaskuläre Erkrankungen
- Hypertonie
- T2DM
- Dyslipidämie
- Diverse Malignome
- Demenz
- Angst, Depression
- Gewichtszunahme
- Stürze / Sturzverletzungen
- Schwangerschaft: Gewichtsexzess, GDM, postpartale Depression

- Lebensqualität
- Schlaf
- Kognitive Leistungen
- Gewichtsabnahme
- Gewichtsstabilität
- Knochengesundheit

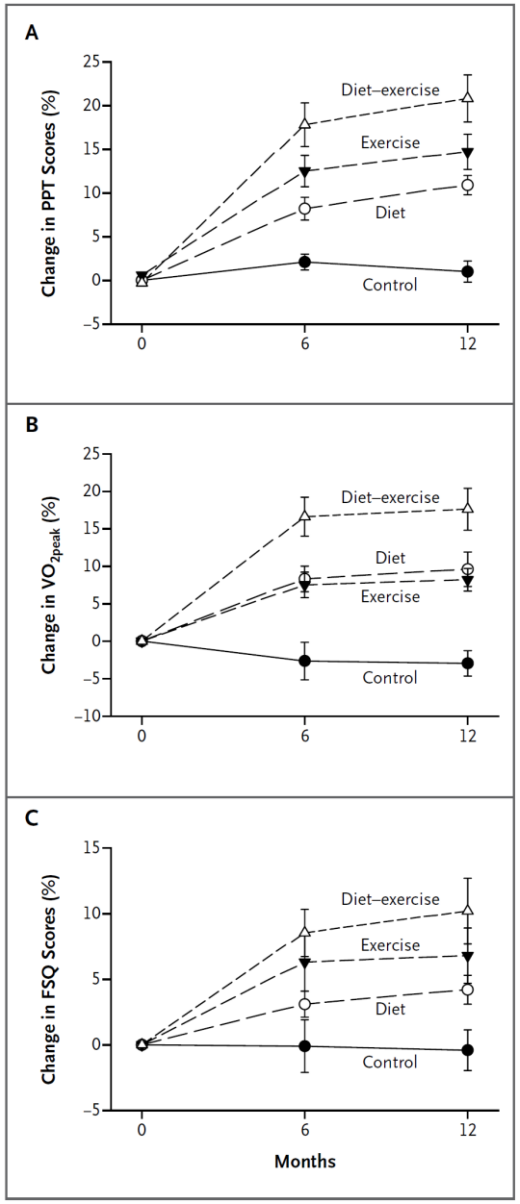
# Körperliche Aktivität zur Therapie der Adipositas

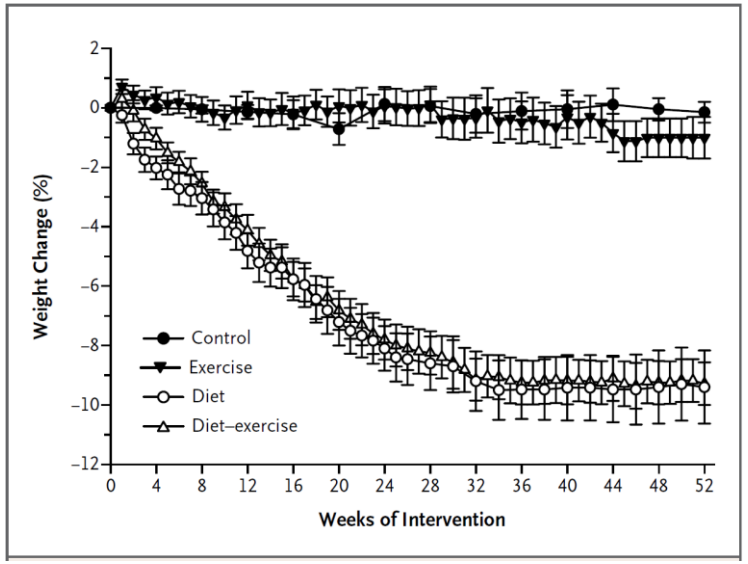
moderater Nutzen in Metaanalysen: minus 1.6 kg;
hohe vs niedrige Intensität: Differenz 1.5 kg
Moderate Reduktion von Taillenumfang und Blutdruck

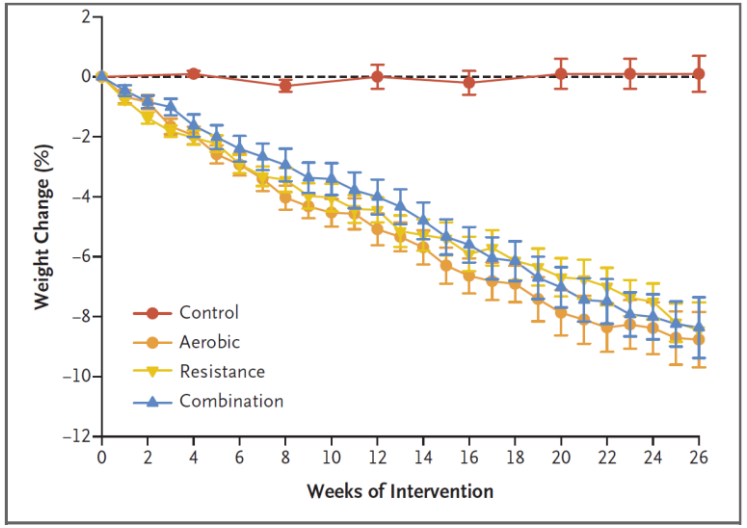
Vergleich mit Diät alleine: Bessere Reduktion der Körperfettmasse, gleiche Reduktion von abdominalem / viszeralem Fett und Insulinresistenz

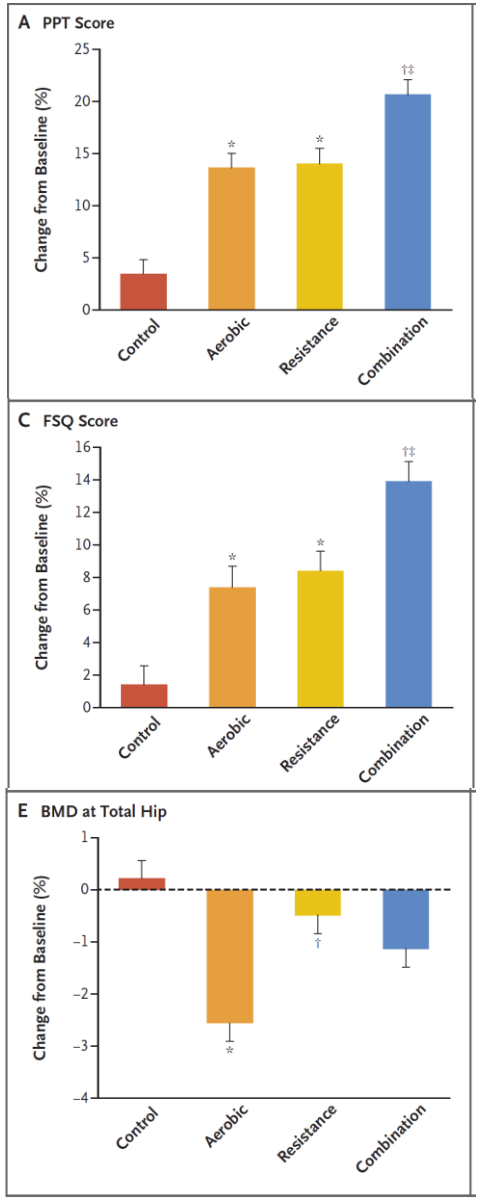
*Cochrane Database Syst Rev 2006;Oct:CD003817; AmJMed 2011;124:747-55*

# Diät oder Training (Kraft-?, Ausdauer-?) bei älteren Patienten?




PPT….Physical Perfomance Test; FSQ…. Functional Status Questionnaire

*NEJM 2011;364:1218-29; NEJM 2017;376:1943-55; ExpGerontol 2021;155:111561*

# Körperliches Training

Wahrscheinlich Kombination Ausdauer- und Krafttraining ideal

andere Studie: höhere Intensität bessere Resultate im oGTT

für viele Patienten: (forciertes) Gehen am Besten

*Arch Intern Med 2009; 169:122; CMAJ Open 2014; 2:E306; JAMA 1999; 281:335*

**Any exercise program should be designed to fit into the health and physical conditions of the participant.**

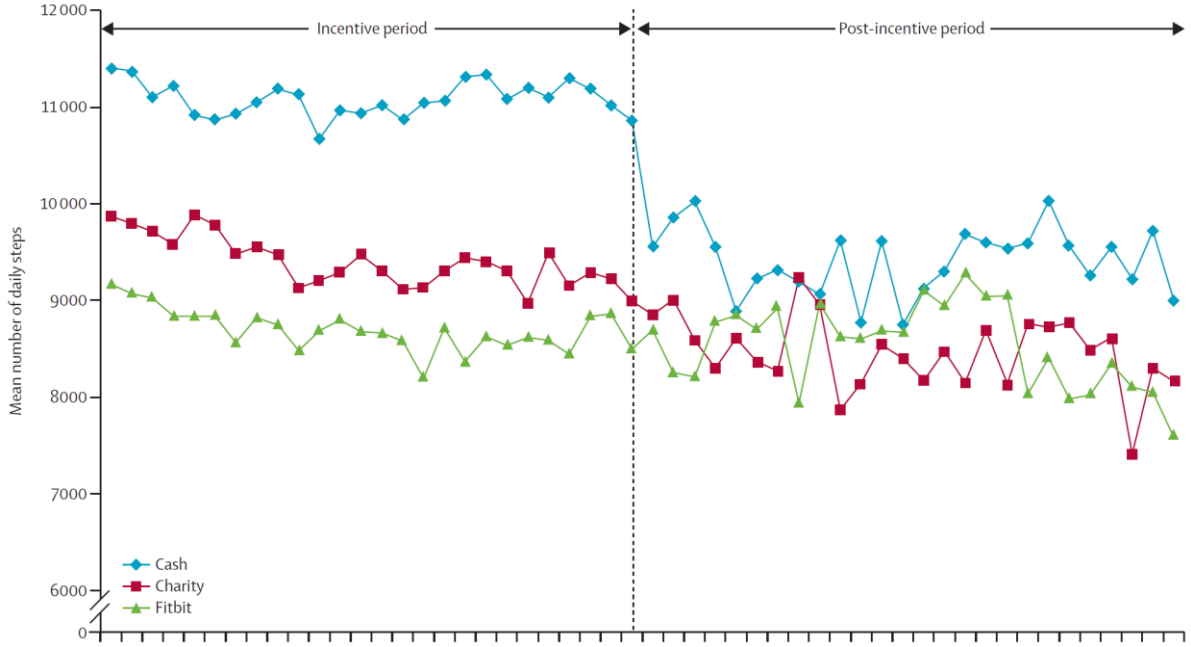
Empfehlungen:
zusätzlich 1000 – 1200 kcal / Woche bzw > 150 kcal / Tag
Gewichtserhaltung: meist > 60 min täglich moderate Intensität

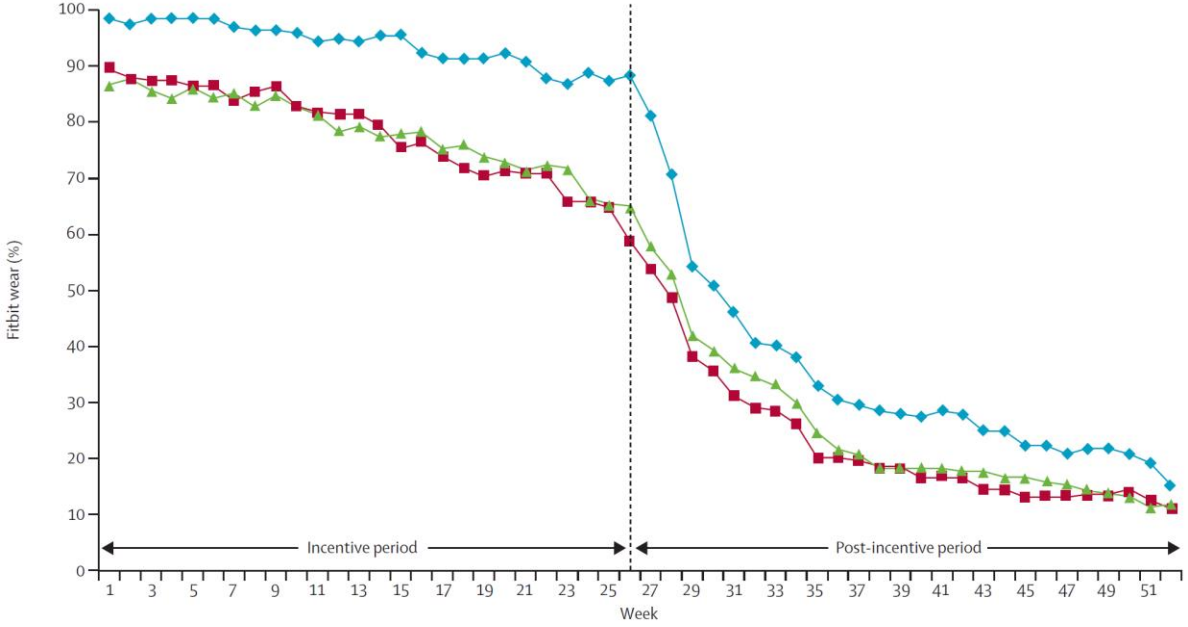
# „Activity tracker“ - Fitnessarmband

| | Standard intervention | Enhanced intervention |
|---|---|---|
| Weight, mean (95% CI), kg | | |
| Baseline | 95.2 (93.0-97.3) | 96.3 (94.2-98.5) |
| 24 mo | 89.3 (87.1-91.5) | 92.8 (90.6-95.0) |
| Estimated weight loss, mean (95% CI), kg | 5.9 (5.0-6.8) | 3.5 (2.6-4.5) |
| Difference: 2.4 kg (95% CI 1.0-3.7), p=0.002 | | |

*JAMA 2016;316:1161-71; Lancet Diabetes Endocrinol 2016;4:983-95*

# „Activity tracker“ - Fitnessarmband




*JAMA 2016;316:1161-71; Lancet Diabetes Endocrinol 2016;4:983-95*

# Ernährung

| | | |
|---|---|---|
| (Protein-)Modifiziertes Fasten<br>(Very Low Caloric Diet, VLCD) | Max. 400-500(-800) kcal/Tag<br>(Protein, Kohlenhydrate, Fette) | Gewichtsreduktion |
| Heilfasten nach Buchinger | Gemüsebrühe, Obst- und Gemüsesäfte und Honig (30 g); reichlich Getränke ärztlich betreut, stationär | Gewichtsreduktion;<br>psychische Veränderungen,<br>Bewusstseinsveränderungen |
| Kontinuierliche Energie-Reduktion<br><br>Intermittierendes Fasten:<br>Alternate-Day Fasting, ADF<br><br>Whole-Day Fasting (WDF)<br><br>Time-Restricted Feeding | Täglich (500-)800-1000 kcal unter dem Energieumsatz<br><br>Abwechselnd 1 Tag keine Energiezufuhr (oder 25% des Energieumsatzes) und 1 Tag *Ad-libitum*-Ernährung<br>Abwechselnd Tage mit Nulldiät und nicht limitierter Energieaufnahme (2/5)<br>Tageszeitlich begrenztes Fasten (20 h «undereating», 4 h «overeating»;<br>nur 1 Mahlzeit/Tag) | *Ziel:* Gewichtsabnahme; Verlängerung der Lebenszeit; verzögerte degenerative Prozesse; Reduktion von kardiovaskulären Risikofaktoren |
| Totales Fasten<br>(Nulldiät; Crash-Diät) | mehrere Tage keine/geringe Energie-aufnahme (max. 25% des Umsatzes); energiefreie Getränke erlaubt | Schnelle Gewichtsabnahme |

| | |
|---|---|
| Low-carbohydrate Diät | 60-130 g KH (245-530 kcal) / Tag |
| Very-low carbohydrate Diät (ketogene Diät) | 0-60 g KH |
| High-protein Diät | Mindestens 20 % der Kalorien von Protein |
| Mediterrane Diät | Viele ungesättigte Fettsäuren; moderat Alkohol; viel Gemüse, Früchte, Hülsenfrüchte, Nüsse, Getreide; moderat Milchprodukte, wenig Fleisch |
| Formula-Diäten | Mahlzeitenersatz durch kalorienreduzierten Shake/Pulver |
| Low-fat Diät | Fett < 30 % |
| High-monounsaturated-fatty-acid Diät | Öl mit 60 % MUFA |
| Vegetarische Diät | |
| Diäten mit niedrigem glykämischem Index | |
| Very low calorie diet | 200-800 kcal / Tag |
| “Hunger-Diät” | < 200 kcal / Tag |

# Intervallfasten

**16:8** **20:4** **23:1** **5:2 (WDF)** **ADF**

WDF: Abnahme des Körpergewichts und der Fettmasse im Vergleich zu den jeweiligen Ausgangswerten beziehungsweise im Vergleich zu einer nicht fastenden Kontrollgruppe.

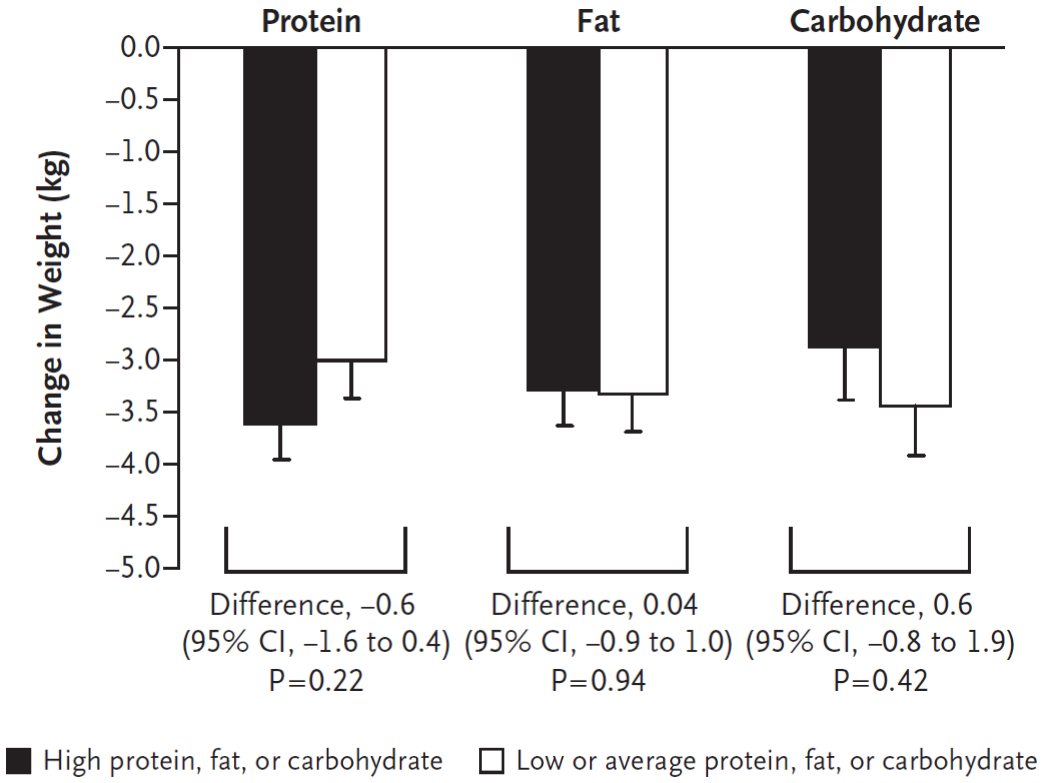
ADF vs WDF keine methodisch bedingten Unterschiede: Gewichtsabnahme nur beeinflusst vom Ausmass der Energiereduktion

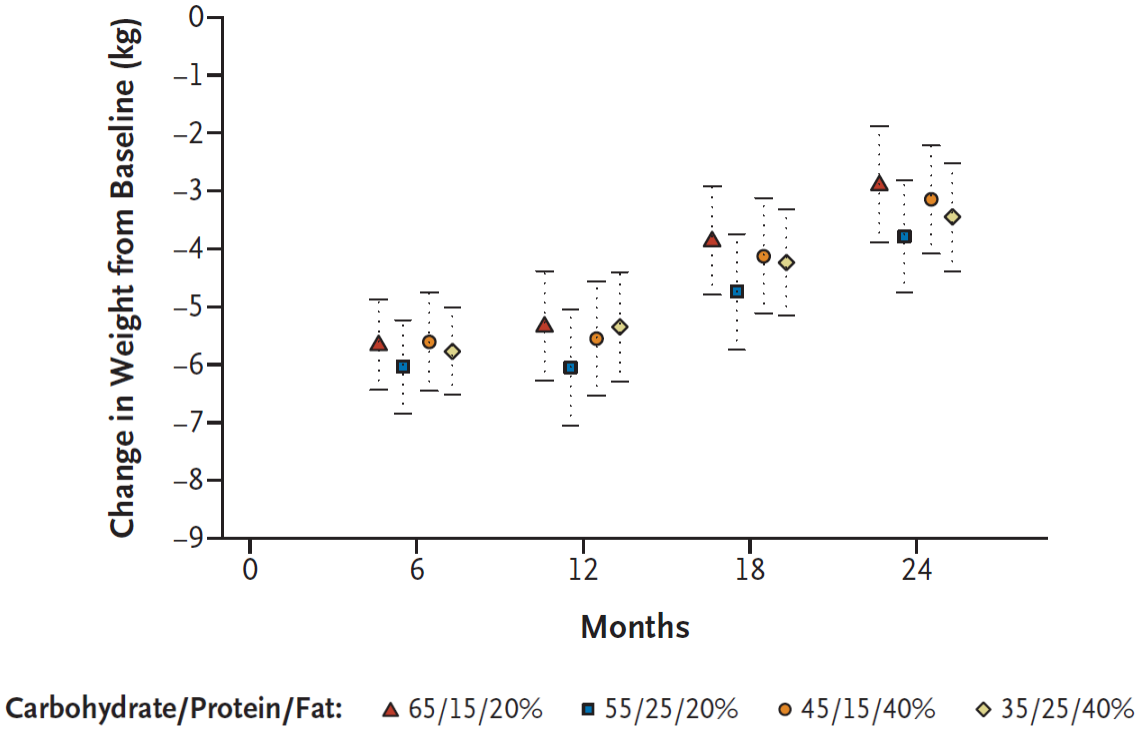
*NutrRev 2015 – 73 – 661-74*

Time Restricted Feeding: im cross-over Design leichte Abnahme der Energieaufnahme (–65 kcal/Tag), nach 8 Wochen messbare Abnahme des Körpergewichts und der Körperfettmasse

*AJCN 2007 – 85 – 981-8*

# Comparison of Weight-Loss Diets with Different Compositions of Fat, Protein, and Carbohydrates



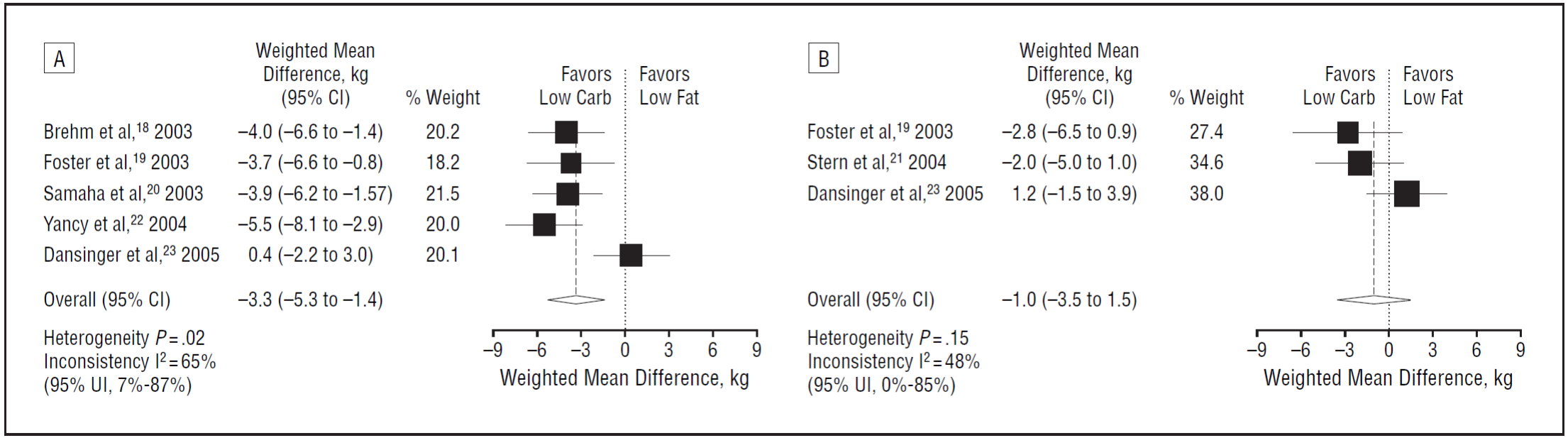




Conclusions: Reduced-calorie diets result in clinically meaningful weight loss regardless of which macronutrients they emphasize.

*NEJM 2009;360:859-73*

# Effects of Low-Carbohydrate vs Low-Fat Diets on Weight Loss and Cardiovascular Risk Factors

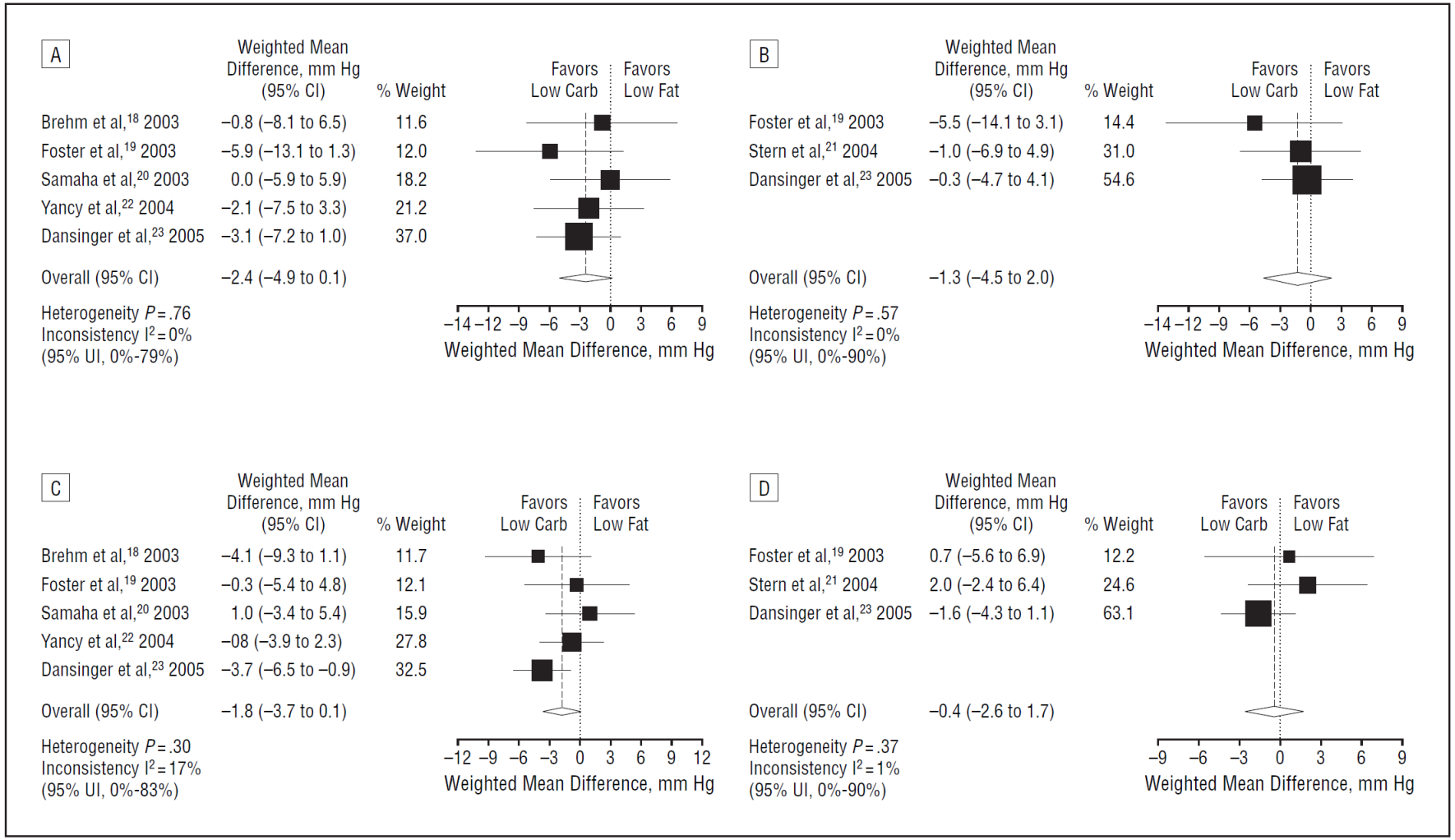
Weighted mean differences in weight loss after 6 (A) and 12 (B) months of follow-up




*Arch Int Med 2006;166:285-93*

# Effects of Low-Carbohydrate vs Low-Fat Diets on Weight Loss and Cardiovascular Risk Factors

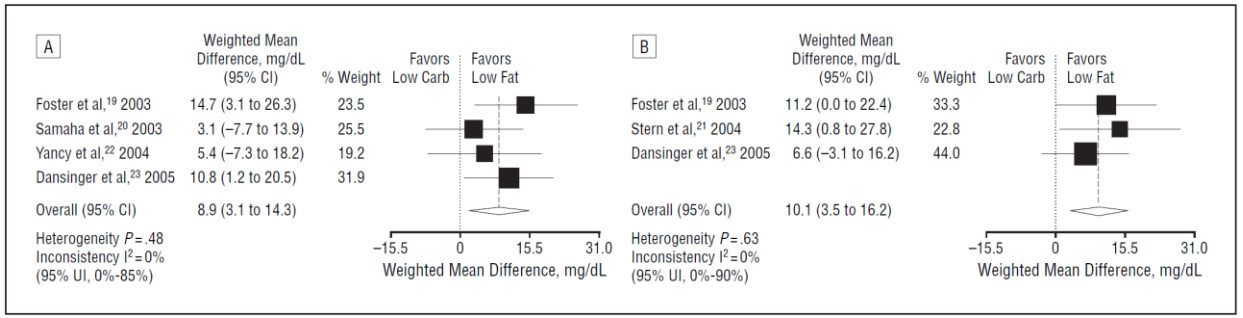
Weighted mean differences in systolic and diastolic blood pressure (BP) after 6 and 12 months of follow-up.

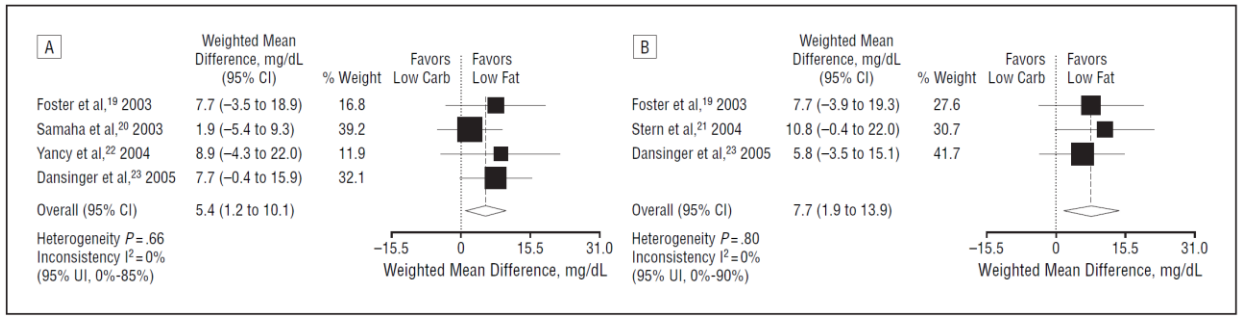



*Arch Int Med 2006;166:285-93*

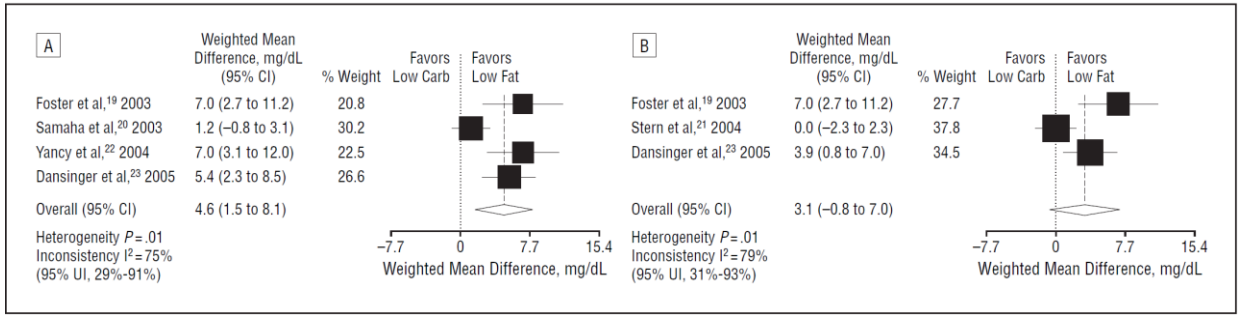
# Effects of Low-Carbohydrate vs Low-Fat Diets on Weight Loss and Cardiovascular Risk Factors

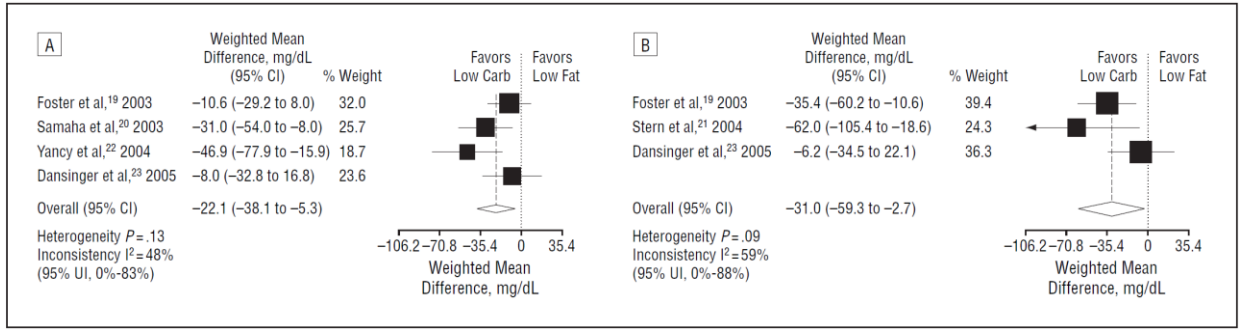
Weighted mean differences in total and LDL cholesterol level after 6 (A) and 12 (B) months of follow-up.




Weighted mean differences in HDL cholesterol and triglyceride level after 6 (A) and 12 (B) months of follow-up.

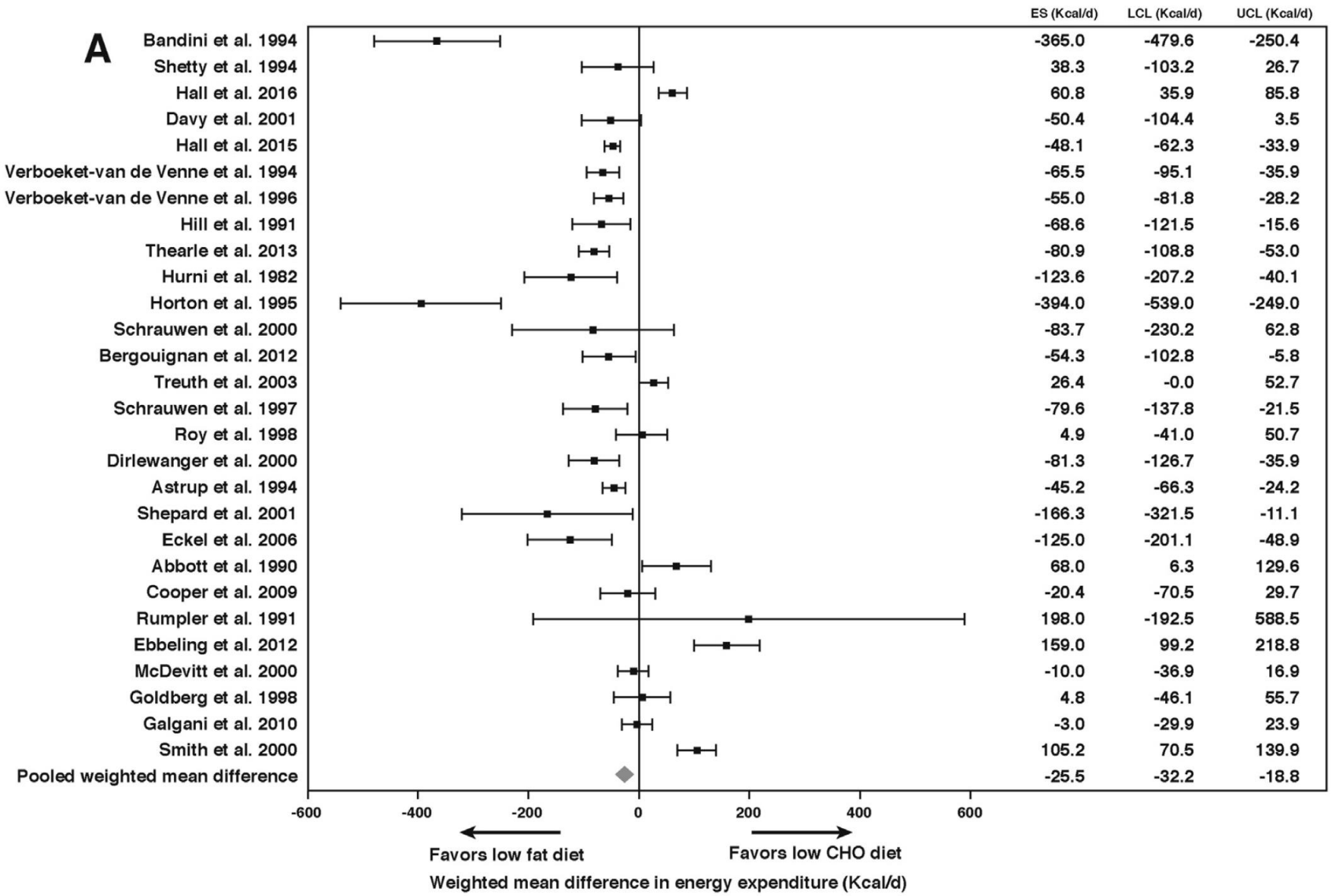



*Arch Int Med 2006;166:285-93*

# Obesity Energetics: Body Weight Regulation and the Effects of Diet Composition

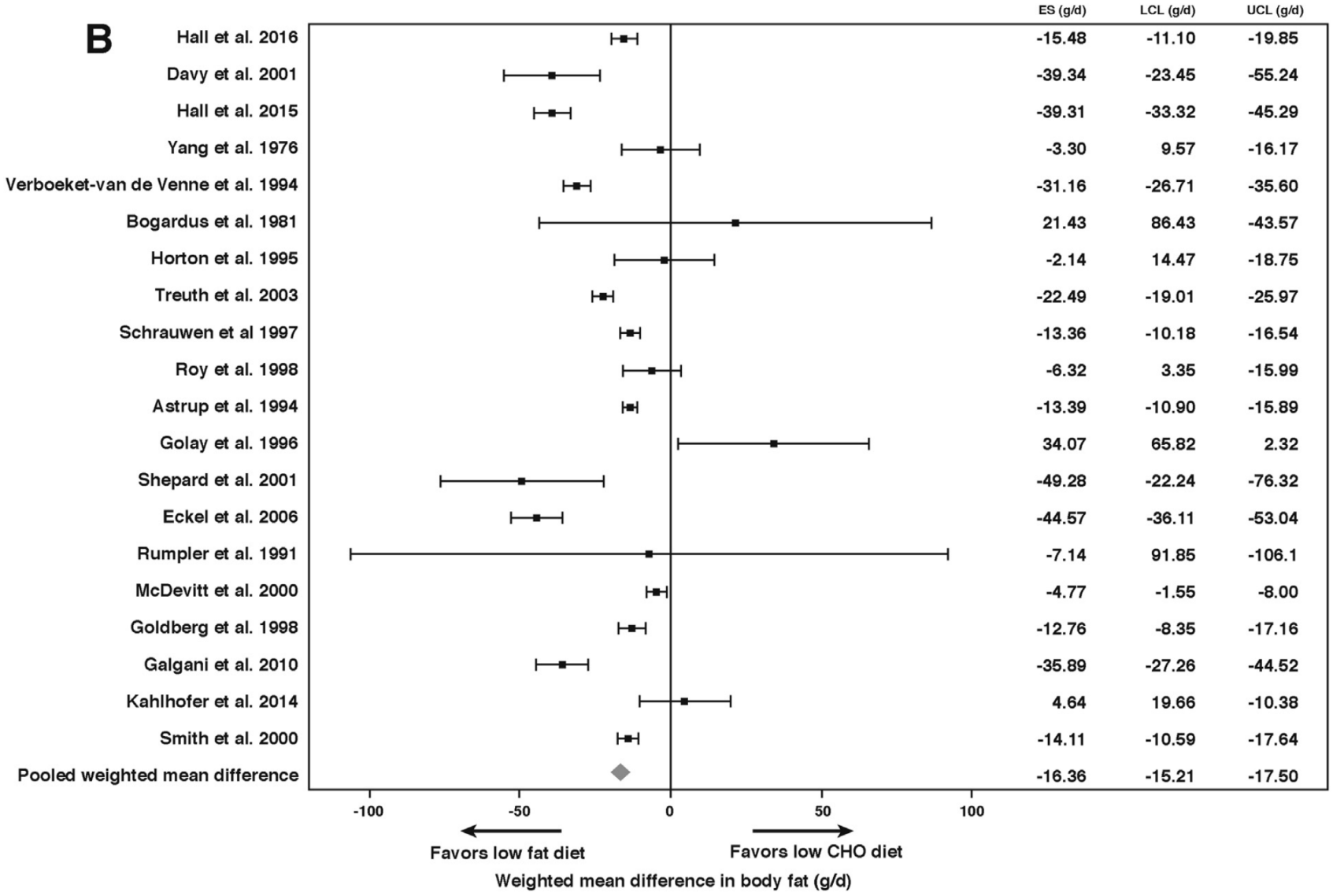
## Energy expenditure




*Gastroenterology 2017;152:1718-27*

# Obesity Energetics: Body Weight Regulation and the Effects of Diet Composition

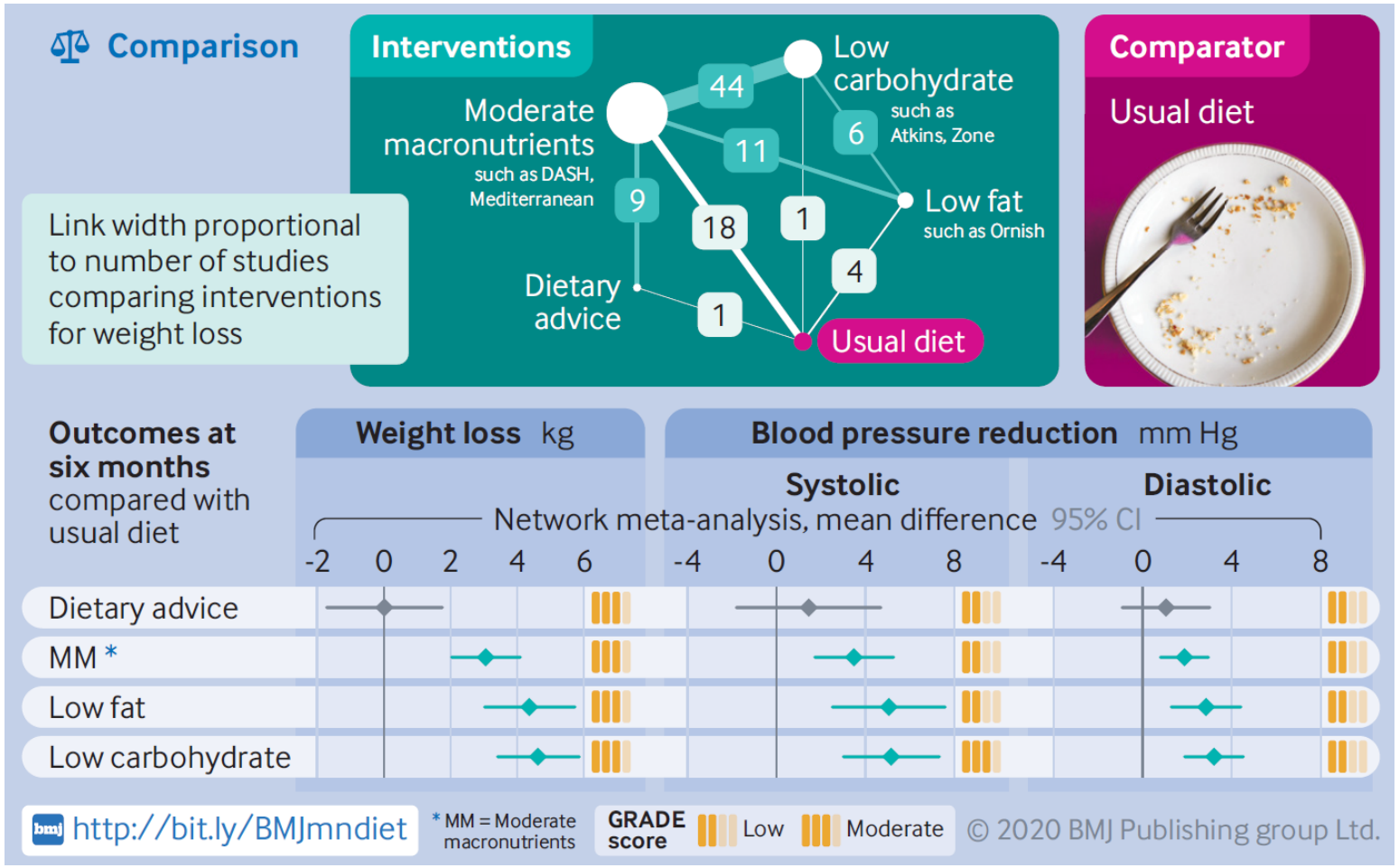
## Body fat




*Gastroenterology 2017;152:1718-27*

# Comparison of dietary macronutrient patterns of 14 popular named dietary programmes for weight and cardiovascular risk factor reduction in adults: systematic review and network meta-analysis of randomised trials

*BMJ 2020;369:m696*




121 RCTs, 21 942 pts

12 month follow-up: Weight reduction diminished; aside from the Mediterranean diet for LDL reduction, improvements in cardiovascular risk factors largely disappeared.

**Differences between diets were typically small to trivial and often based on low certainity evidence**

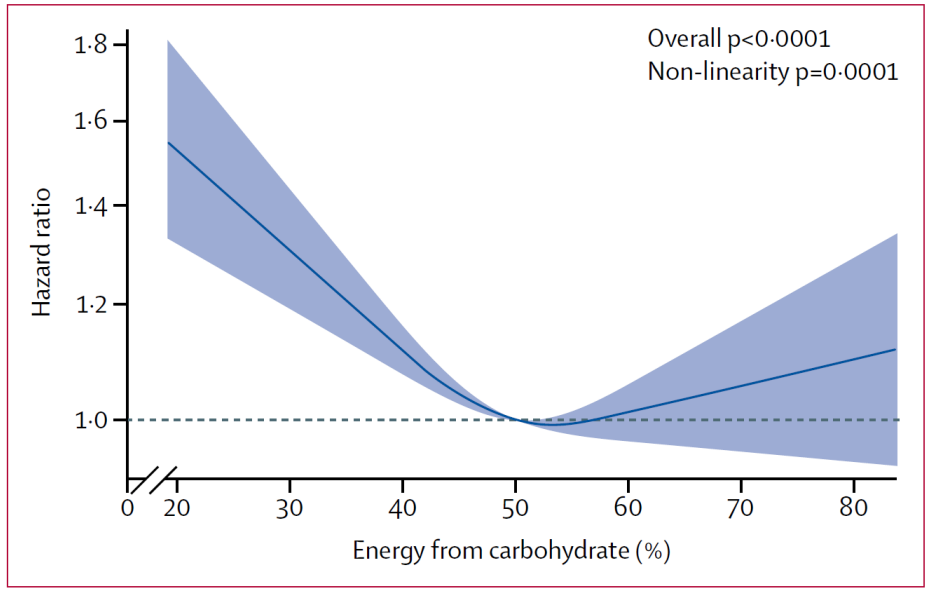
# Low-Carbohydrate Diets and All-Cause and Cause-Specific Mortality

Nurses' Health Study and Health Professionals' Follow-up Study

…….modest increase in overall mortality in a pooled analysis (hazard ratio [HR] comparing extreme deciles, 1.12 [95% CI, 1.01 to 1.24]; *P* for trend 0.136).

…. animal low-carbohydrate score – higher mortality….
…. vegetable low-carbohydrate score – lower mortality….

Long-term risks of low-CHO ketogenic diet:
Atherosclerosis Risk in Communities (ARIC) study:

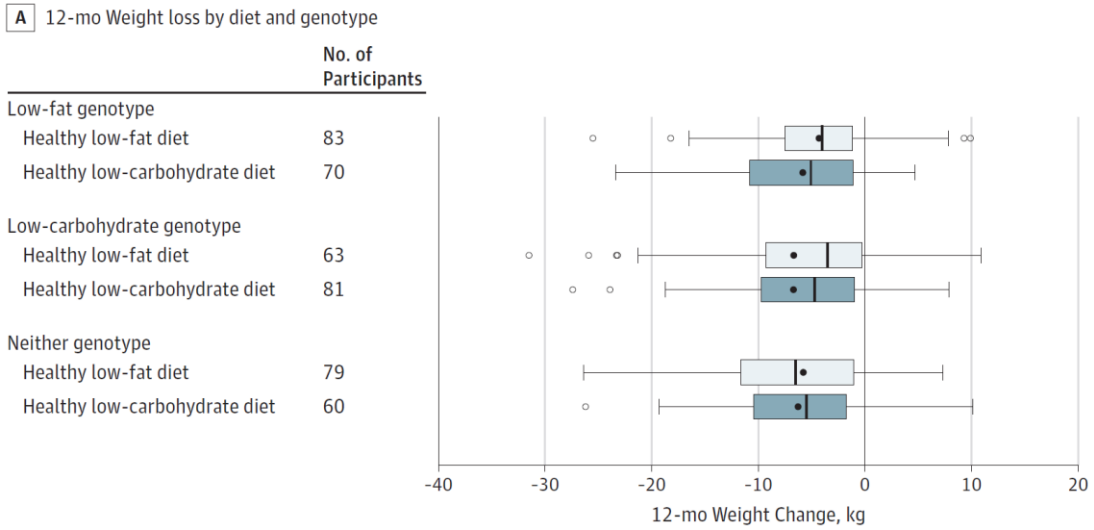


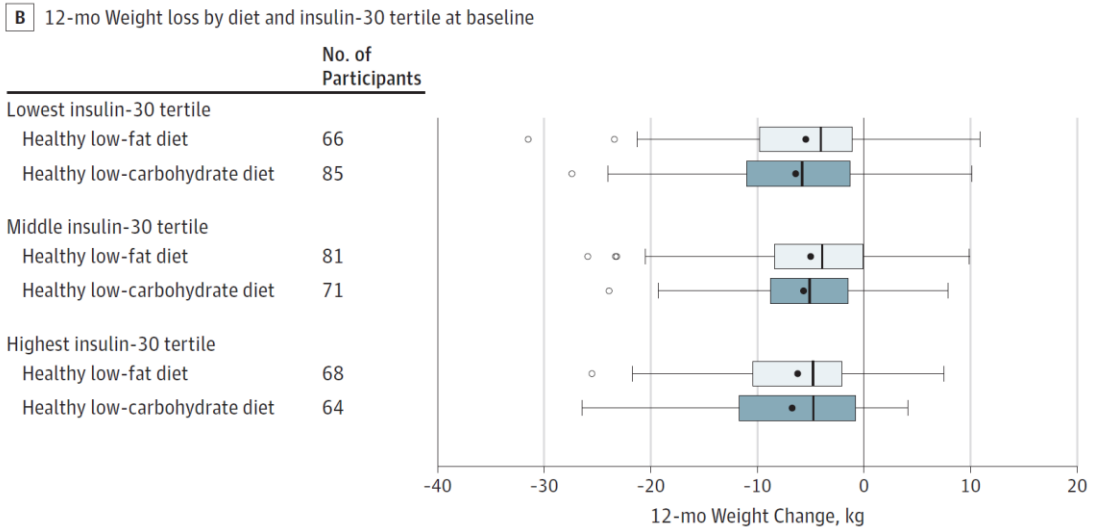

all-cause mortality

*Annals Intern Med 2010;153:289-98, Lancet Public Health 2018;3:e419-28*

# Effect of Low-Fat vs Low-Carbohydrate Diet on 12-Month Weight Loss in Overweight Adults and the Association With Genotype Pattern or Insulin Secretion

## The DIETFITS Randomized Clinical Trial



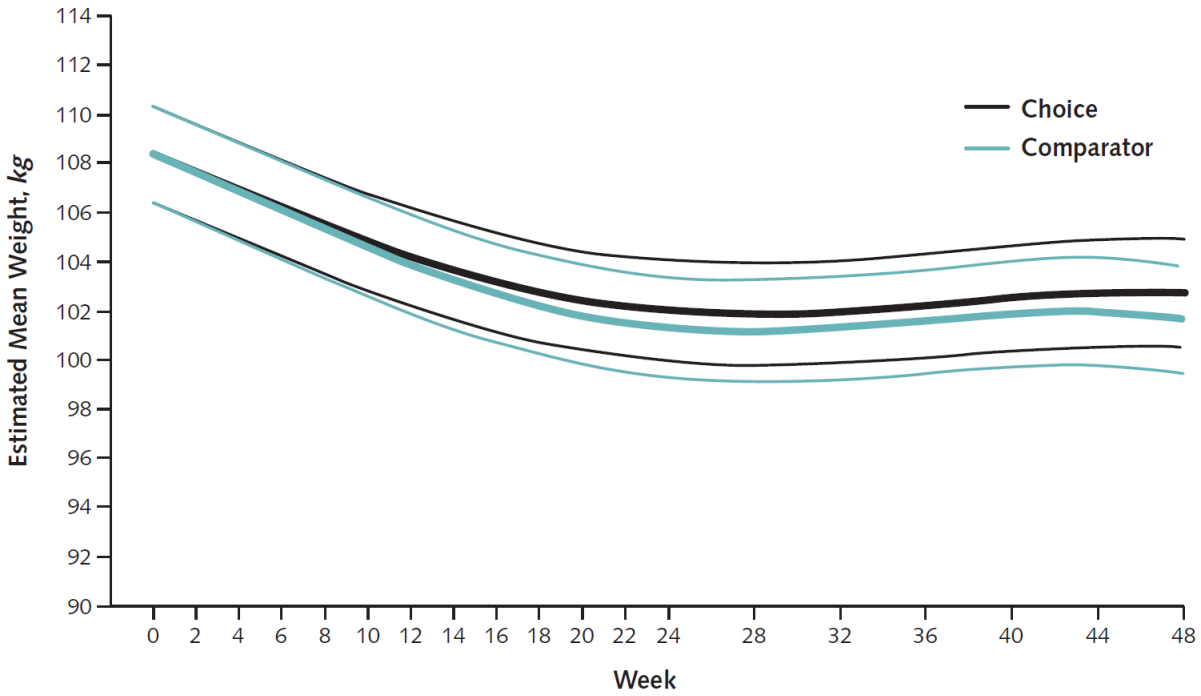

SNPs from 3 genes (*PPARG*, *ADRB2*, and *FABP2)*

*JAMA 2018;319:667-79*

# Effect of Allowing Choice of Diet on Weight Loss

Doppel-Randomisierung: A) Wahl zwischen 2 Diäten, B) low-carb vs low-fat

Mean weight trajectories and 95% CIs over 48 wk.




| Participants, *n* | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Choice | 105 | 100 | 89 | 82 | 79 | 76 | 87 | 78 | 67 | 71 | 65 | 62 | 84 | 61 | 55 | 80 | 49 | 47 | 87 |
| Comparator | 102 | 97 | 92 | 92 | 89 | 80 | 88 | 76 | 77 | 68 | 68 | 73 | 92 | 68 | 63 | 81 | 53 | 62 | 88 |

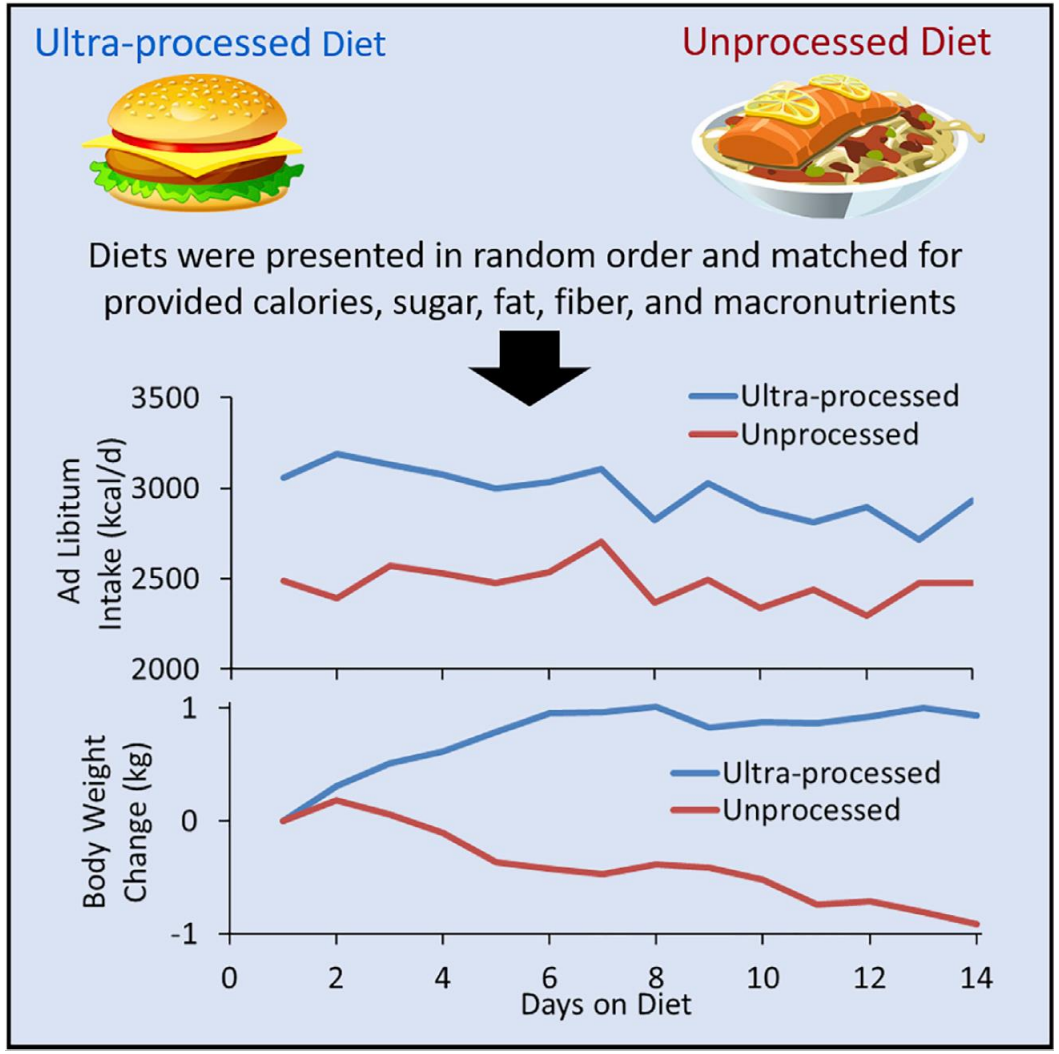
<u>estimated mean weight loss:</u>
choice: 5.7 kg (95% CI, 4.3 to 7.0 kg)
comparator: 6.7 kg (CI, 5.4 to 8.0 kg)
(mean diff. 1.1 kg [CI, 2.9 to 0.8 kg]; *P*=0.26)

*Annals Intern Med 2015;162:805-14*

# Ernährung: Empfehlungen

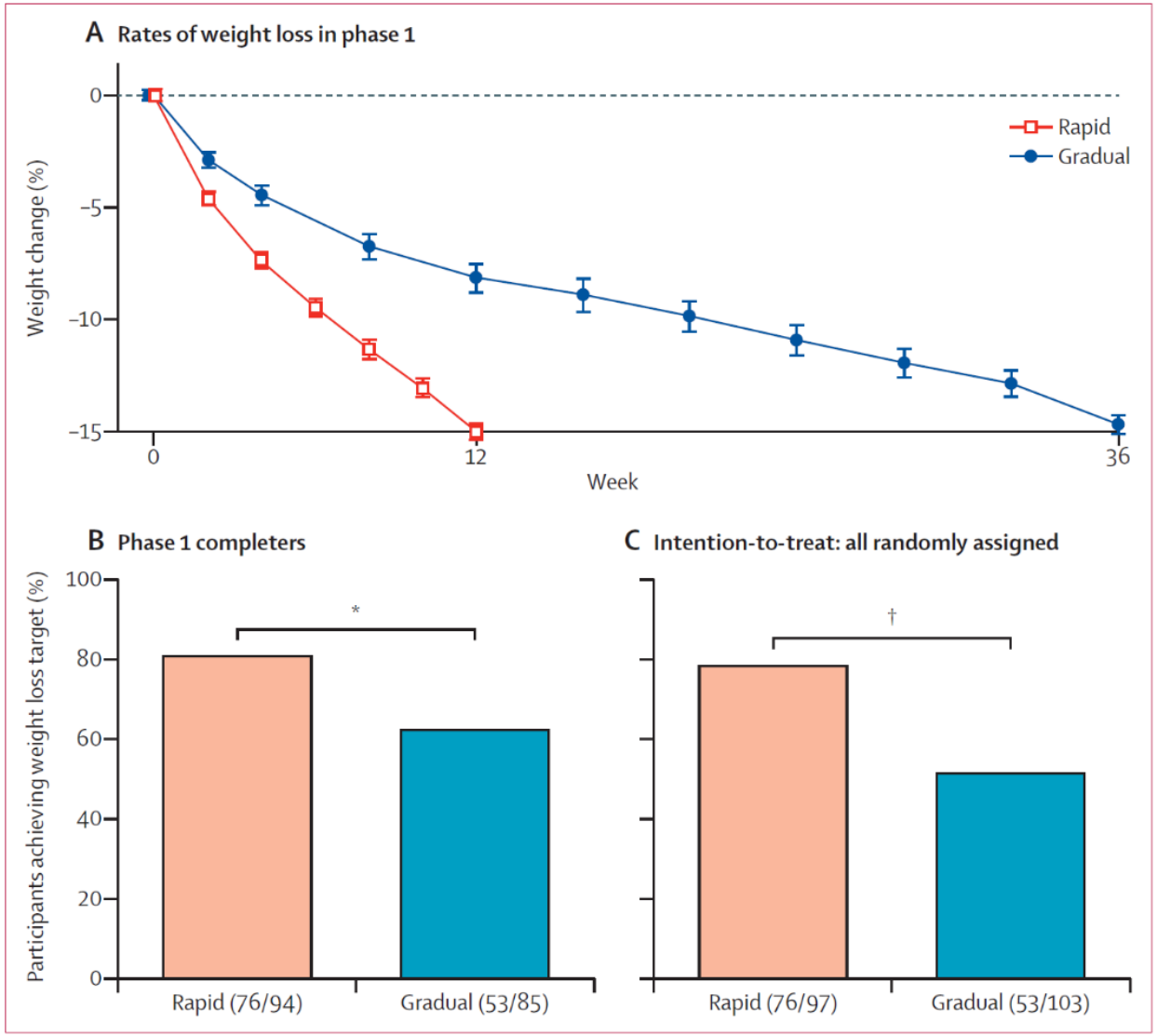
- Kalorienhaltige Getränke (ungewollte Kalorien) und (stark) verarbeitete Lebensmittel meiden
- Kontrolle der Portionen
- Selbstbeobachtung
- Gesundheitsbewusster, langfristiger Zugang zum Essen

# Ultra-Processed Diets Cause Excess Calorie Intake and Weight Gain: An Inpatient Randomized Controlled Trial of *Ad Libitum* Food Intake




*Cell Metabolism 2019;30:67-77*

# Rasche Gewichtsreduktion führt zu rascher Wiederzunahme?




*Purcell et al; Lancet Diab Endocrinol 2014;2:954-62*

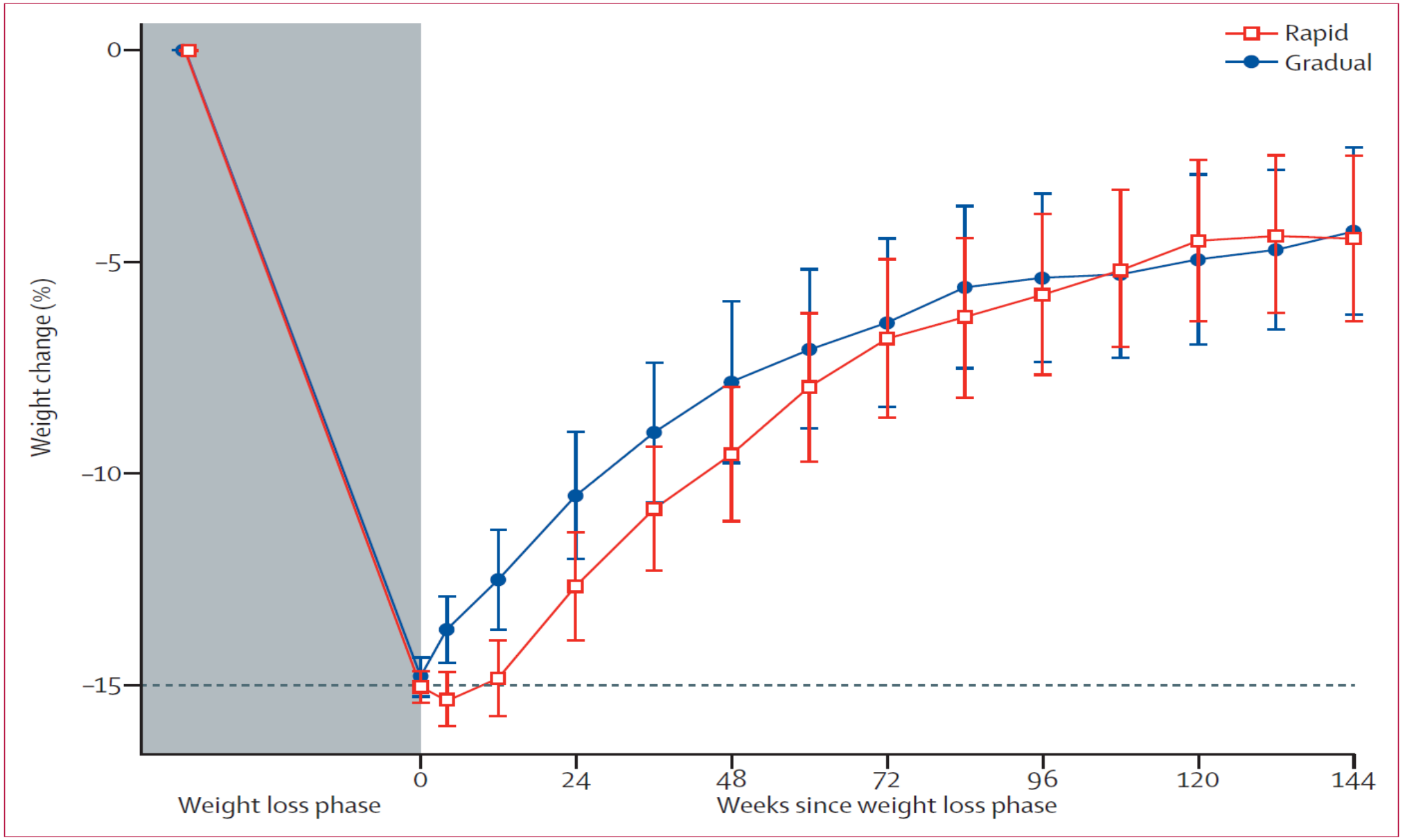
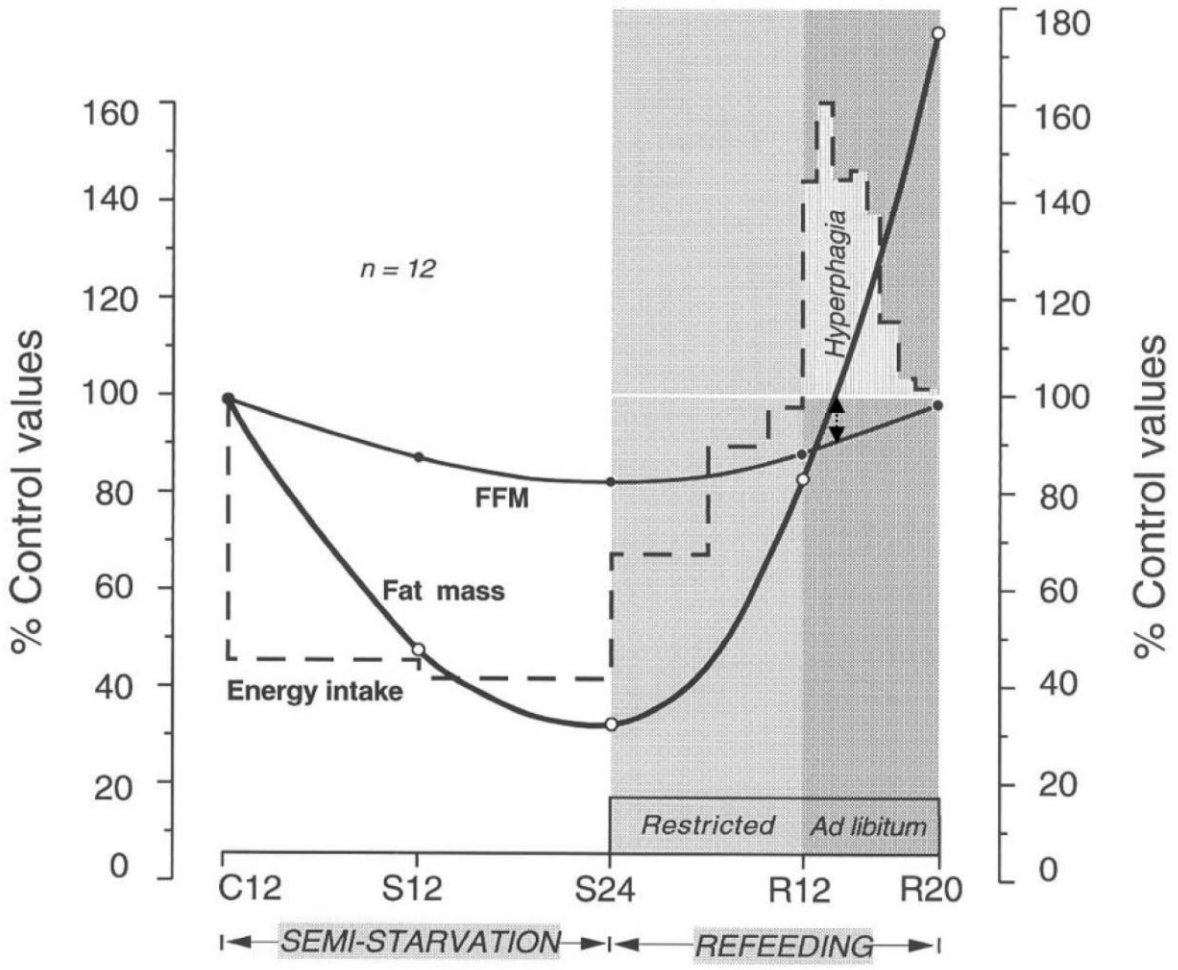
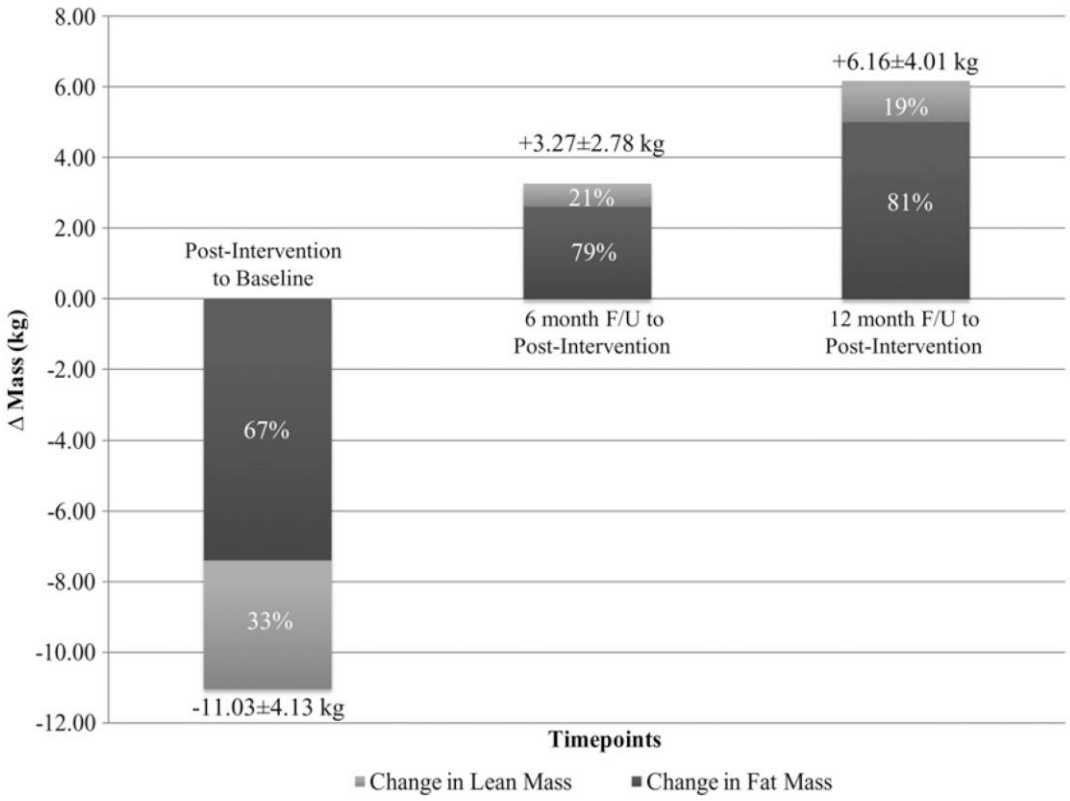



***Figure 3:*** **Mean weight change (% change, 95% CI) during phase 2 for study completers (n=61 in rapid weight loss and n=43 in gradual weight loss group)**




*Obesity Reviews 2015; 16 Suppl1:25-35; AmJClinNutr 2011;94:767-74*

# Gewichtsverlauf über die Zeit……

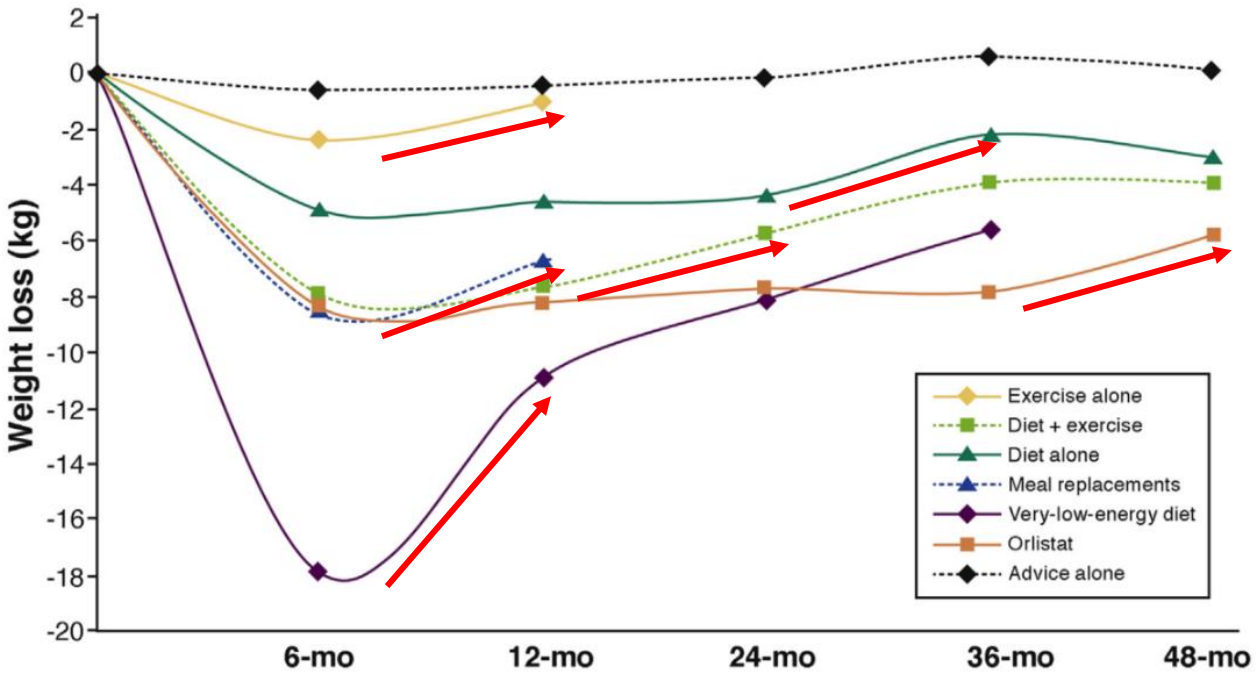
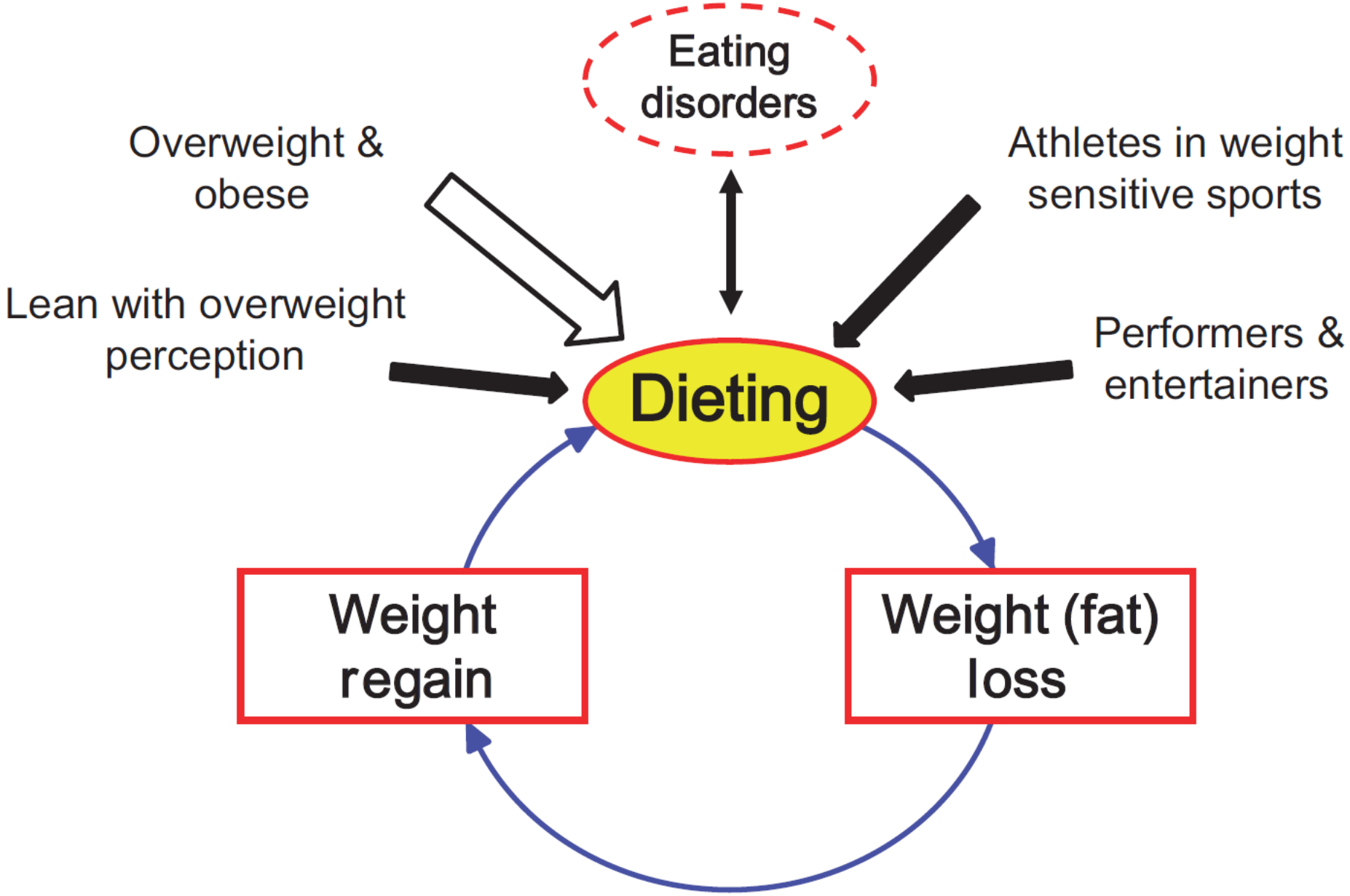


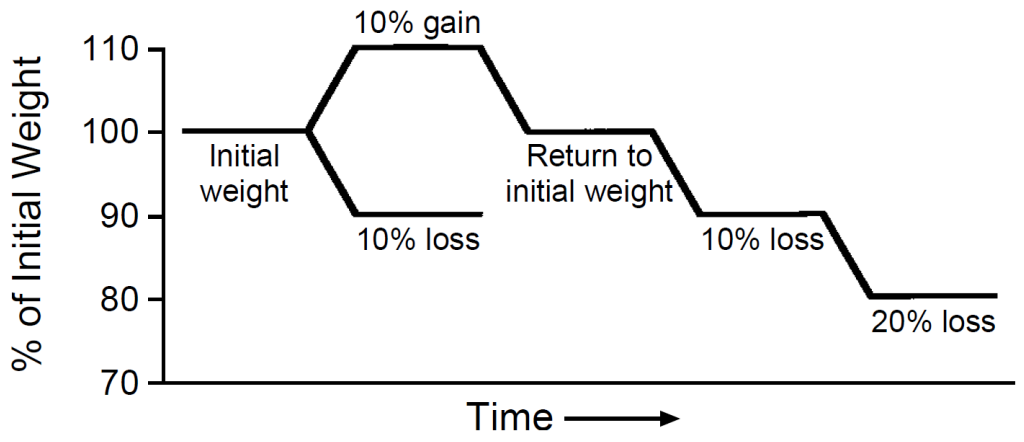

**Figure 2.** Average weight loss of subjects completing a minimum 1-year weight-management intervention based on review of 80 studies (n=26,455; 18,199 completers [69%]). (Reprinted with permission.[69]) (Data from sibutramine has been removed.)

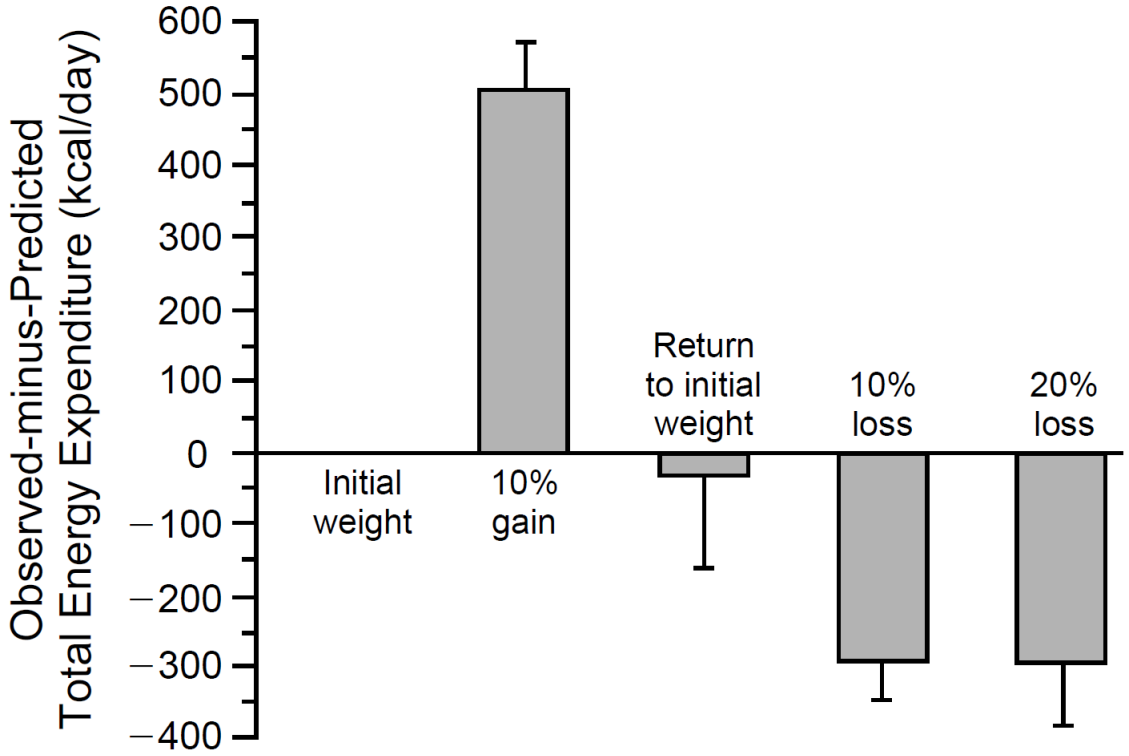
*Gastroenterology May 2017; 152:1739–51*




*Montani et al., Obesity Reviews 2015; 16 Suppl1:7-18*

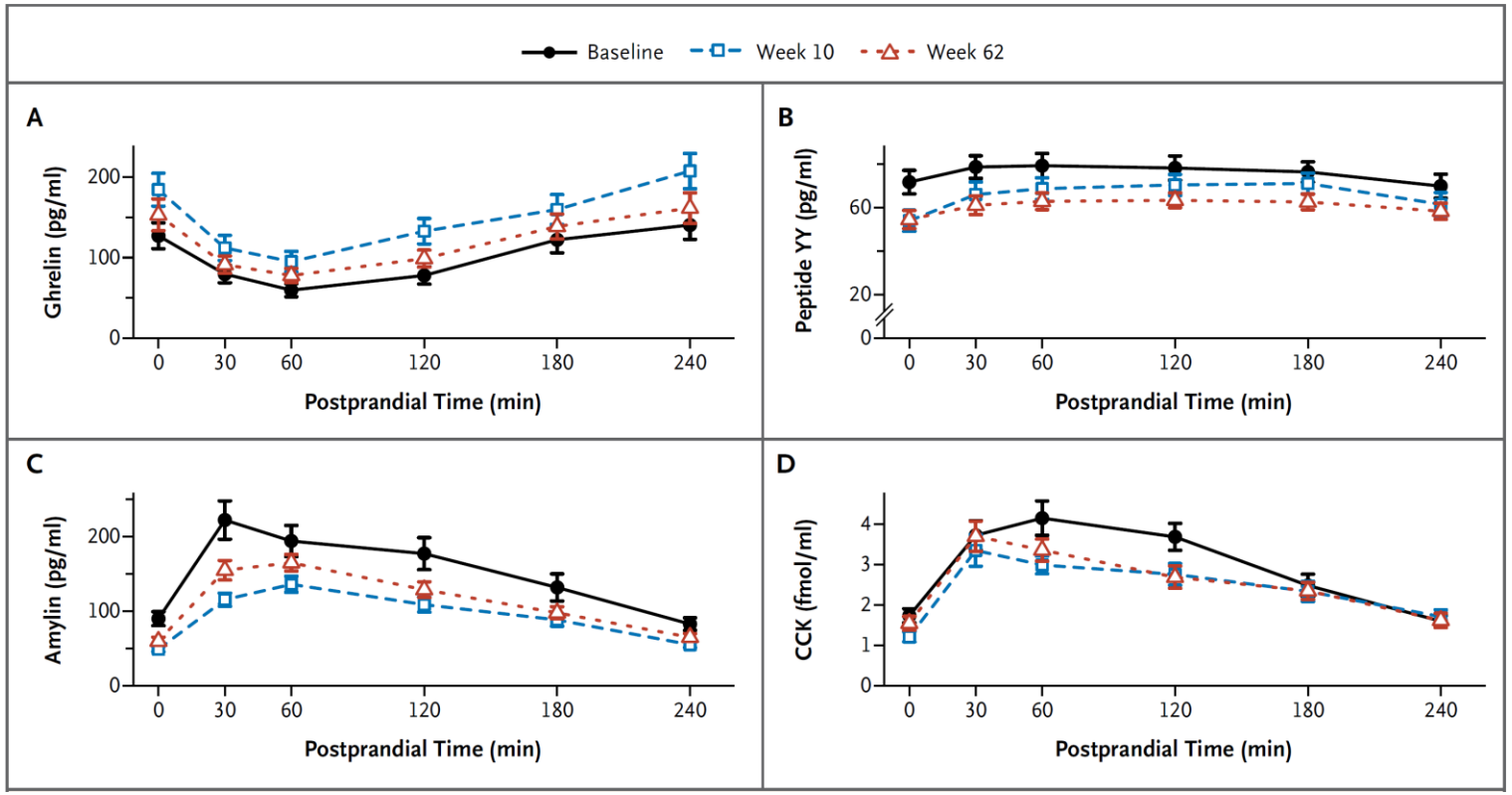
# Changes in energy expenditure resulting from altered body weight

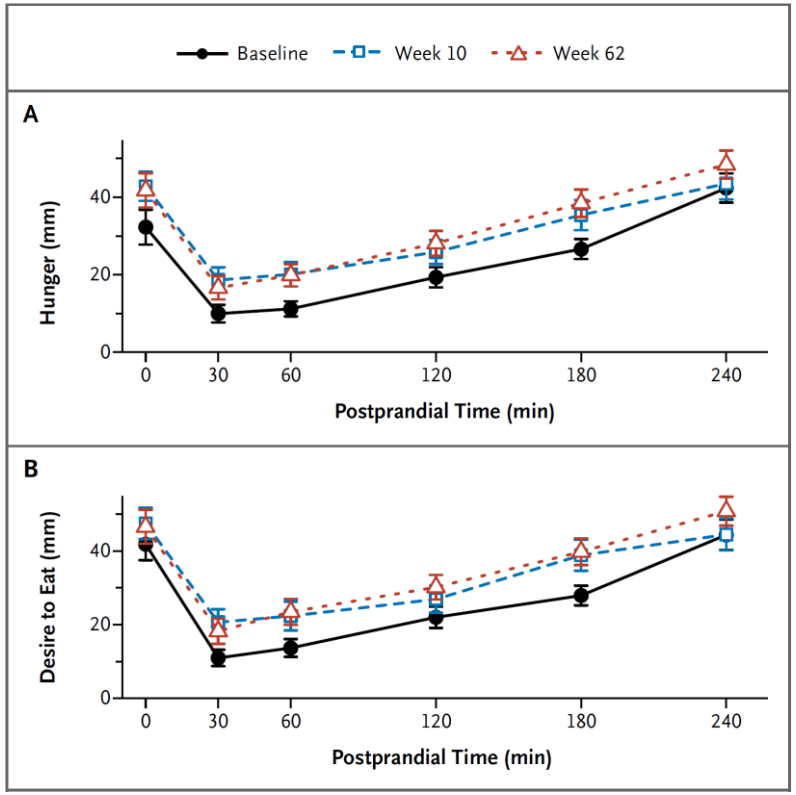



*Leibel et al.; NEJM 1995;332:621-8*

# Long-Term Persistence of Hormonal Adaptations to Weight Loss



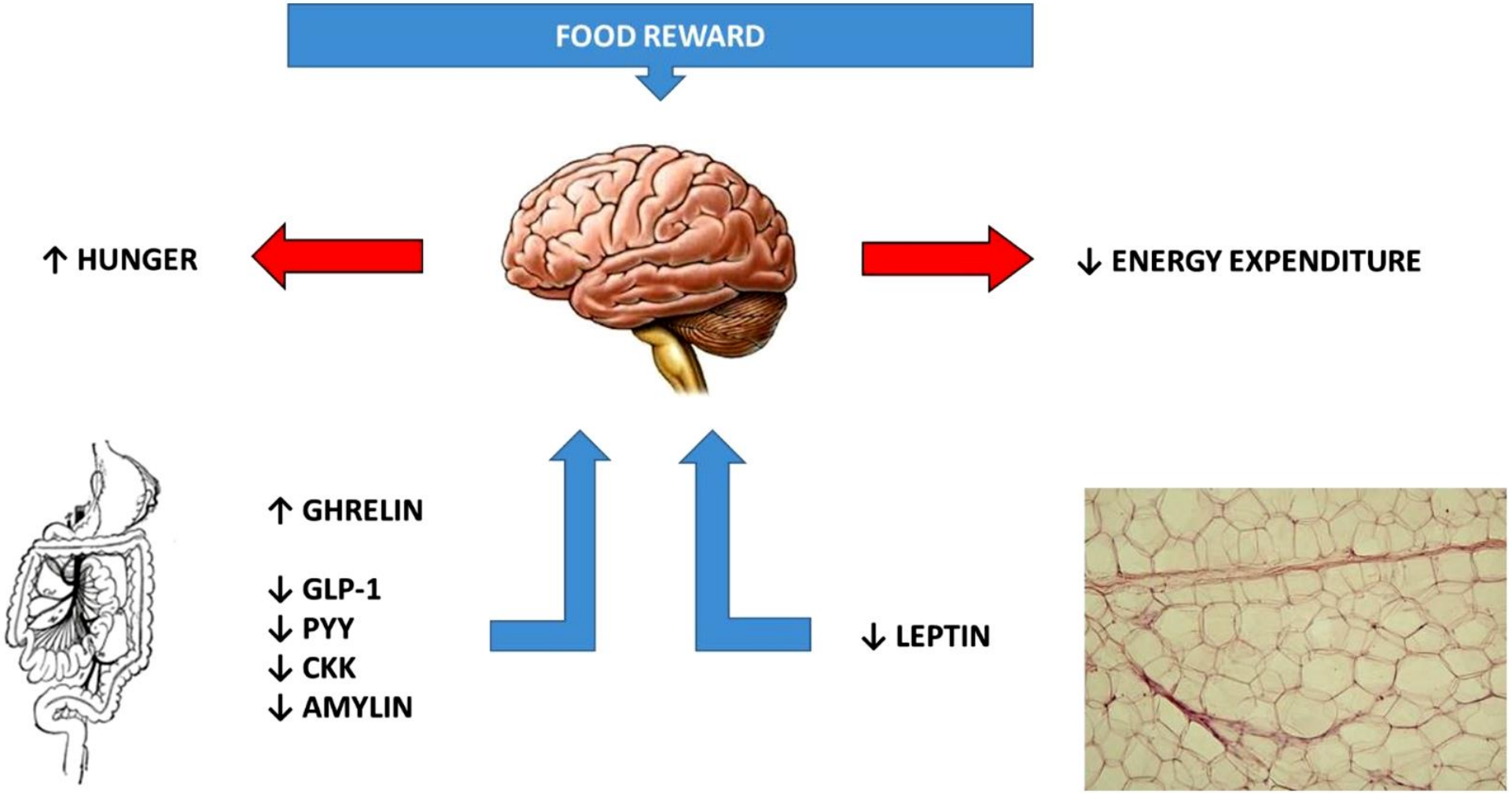

*Sumithran et al; NEJM 2011;365:1597-604*

# Persistent Metabolic Adaptation 6 Years After "The Biggest Loser" Competition

| | Baseline | End of competition at 30 weeks | Follow-up at 6 years | *P* Baseline vs. 30 weeks | *P* Baseline vs. 6 years | *P* 30 weeks vs. 6 years |
|---|---|---|---|---|---|---|
| Age (years) | 34.9 ± 10.3 | 35.4 ± 10.3 | 41.3 ± 10.3 | <0.0001 | <0.0001 | <0.0001 |
| Weight (kg) | 148.9 ± 40.5 | 90.6 ± 24.5 | 131.6 ± 45.3 | <0.0001 | 0.0294 | 0.0002 |
| BMI (kg/m$^2$) | 49.5 ± 10.1 | 30.2 ± 6.7 | 43.8 ± 13.4 | <0.0001 | 0.0243 | 0.0002 |
| % Body fat | 49.3 ± 5.2 | 28.1 ± 8.9 | 44.7 ± 10 | <0.0001 | 0.0894 | 0.0003 |
| FM (kg) | 73.4 ± 22.6 | 26.2 ± 13.6 | 61.4 ± 30 | <0.0001 | 0.0448 | 0.0001 |
| FFM (kg) | 75.5 ± 21.1 | 64.4 ± 15.5 | 70.2 ± 18.3 | <0.0001 | 0.0354 | 0.0101 |
| RQ | 0.77 ± 0.05 | 0.75 ± 0.03 | 0.81 ± 0.02 | 0.272 | 0.0312 | <0.0001 |
| RMR measured (kcal/d) | 2,607 ± 649 | 1,996 ± 358 | 1,903 ± 466 | 0.0004 | <0.0001 | 0.3481 |
| RMR predicted (kcal/d) | 2,577 ± 574 | 2,272 ± 435 | 2,403 ± 507 | <0.0001 | 0.0058 | 0.0168 |
| Metabolic adaptation (kcal/d) | 29 ± 206 | −275 ± 207 | −499 ± 207 | 0.0061 | <0.0001 | 0.0075 |
| TEE (kcal/d) | 3,804 ± 926 | 3,002 ± 573 | 3,429 ± 581 | 0.0014 | 0.0189 | 0.0034 |
| Physical activity (kcal/kg/d) | 5.6 ± 1.8 | 10.0 ± 4.6 | 10.1 ± 4.0 | 0.0027 | 0.001 | 0.8219 |

The predicted RMR was obtained using a linear regression equation developed using baseline data on body composition, age, and sex in the full 16-subject cohort. The *P* values were not adjusted for multiple comparisons.
BMI, body mass index; FM, fat mass; FFM, fat-free mass; RMR, resting metabolic rate; RQ, respiratory quotient; TEE, total energy expenditure.

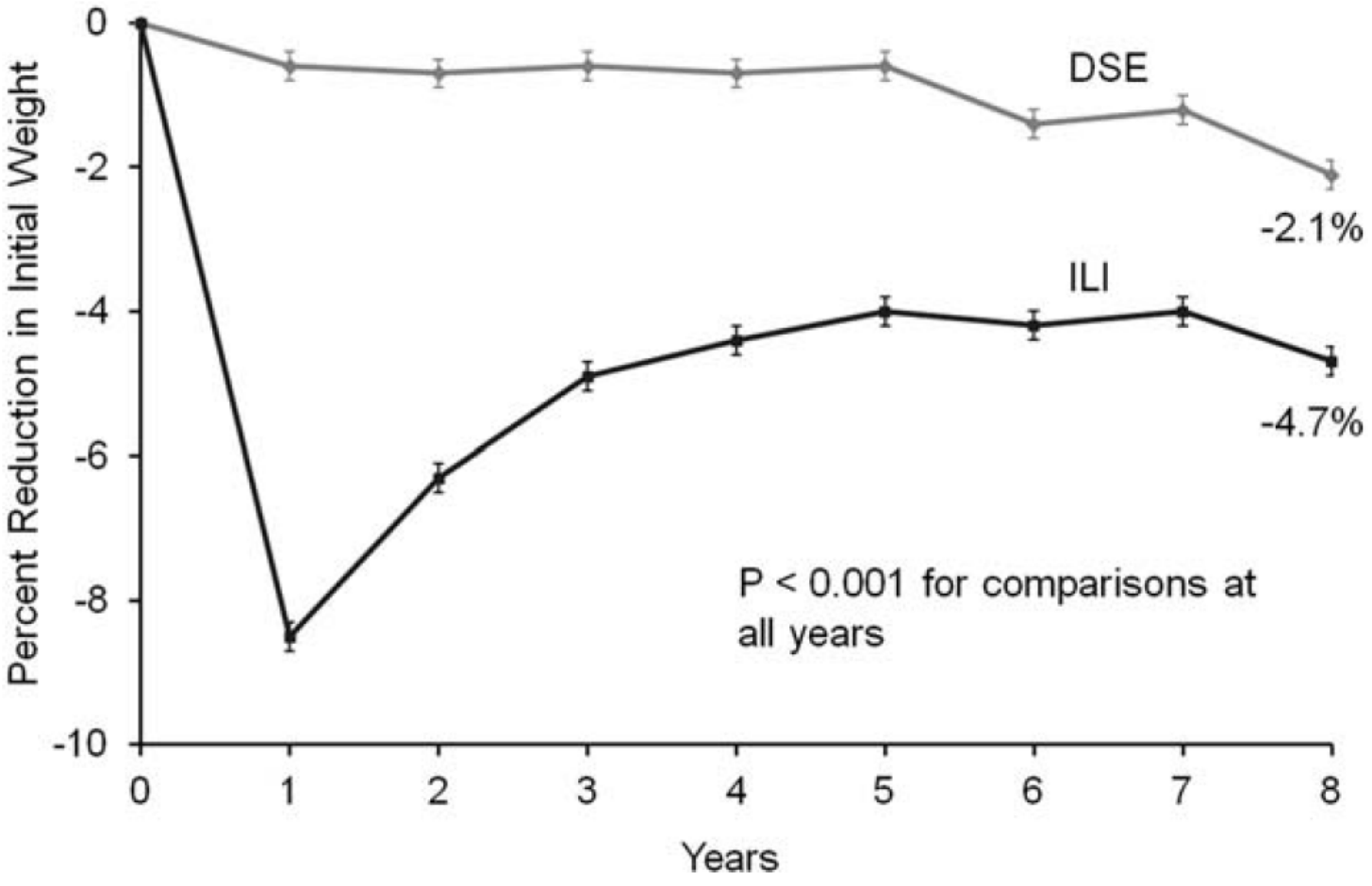
*Fothergill et al., Obesity 2016;24:1612-9*




*Busetto et al; Eur J Int Med 2021; Jan 16*

# Cave: sarkopene Adipositas

# Eight-Year Weight Losses with an Intensive Lifestyle Intervention: The Look AHEAD Study (Action for Health in Diabetes)



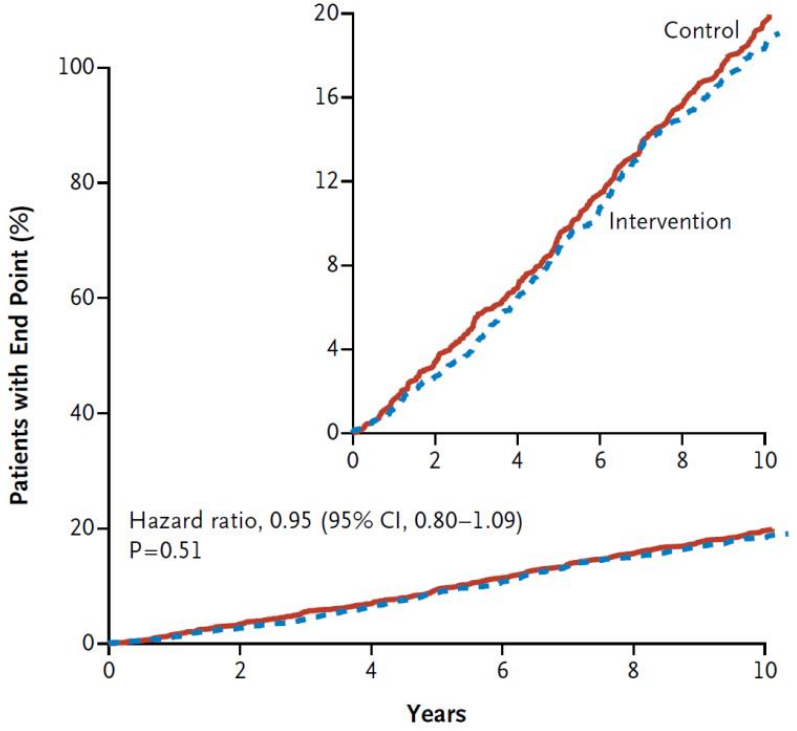

ILI…Intensive Lifestyle Intervention, DSE…Diabetes Support and Education

*Obesity 2014;22:5-13*

# Look AHEAD

Weniger Antihypertensiva, Statine, Insulin
Verbesserung von:

- OSAS
- Inkontinenz
- NAFLD
- Nierenerkrankung
- Depression
- Lebensqualität
- Sexualität
- Mobiltät
- Körperliche Funktionen




| No. at Risk | | | | | | |
|---|---|---|---|---|---|---|
| Control | 2575 | 2425 | 2296 | 2156 | 2019 | 688 |
| Intervention | 2570 | 2447 | 2326 | 2192 | 2049 | 505 |

Endpunkt: Kardiovask. Tod, MI, Schlaganfall, Ang.pect.-Hosp

*NEJM 2013; 369:2356-9*

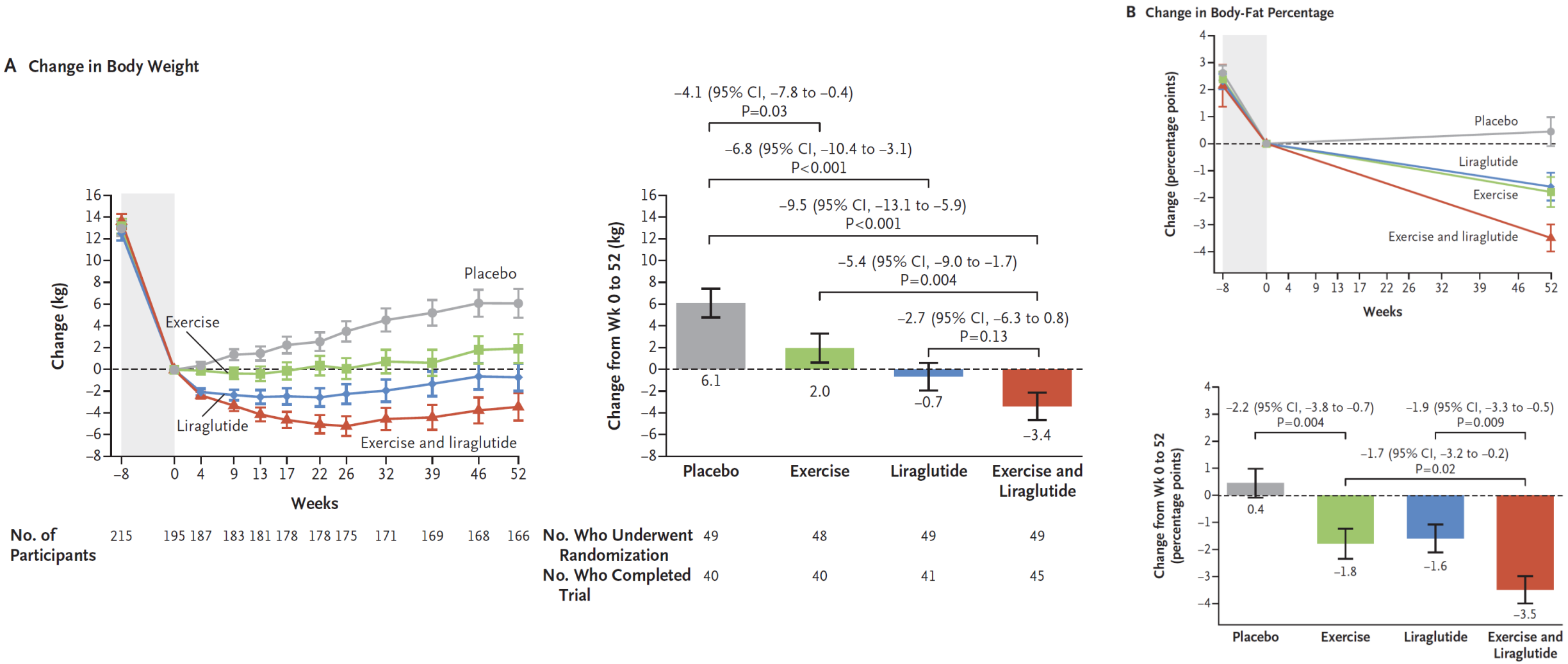
# Association of the magnitude of weight loss and changes in physical fitness with long-term cardiovascular disease outcomes in overweight or obese people with type 2 diabetes: a post-hoc analysis of the Look AHEAD randomized clinical trial

Gewichtsreduktion ≥ 10 % im ersten Jahr (n = 1013, 21%):

- Primärer Endpunkt (kardiovask. Tod, nicht-tödl. MI, Schlaganfall, Hospitalisation wegen AP): minus 21 % (HR 0.79, 95%CI 0.64–0.98; p=0.034)
- Sekundärer Endpunkt (prim. plus CABG, Carotid-Endarterektomie, PCI, Hosp. wg. HI, PAVK, Gesamtmortalität): minus 24 % (HR 0.76, 95% CI 0.63-0.91, p=0.003

*Lancet Diabetes Endocrinol 2016;4:913-21*

# Healthy Weight Loss Maintenance with Exercise, Liraglutide, or Both Combined




*NEJM 2021;384:1719-30*

# Take home messages

- Adipositas: chronische, wiederkehrende, progressive Erkrankung.
- Risiko abklären: BMI, Taillenumfang, Co-Morbiditäten – Therapieziele festlegen.
- Aktivität: je aktiver desto besser.
- Kombination Kraft- und Ausdauertraining wahrscheinlich am Besten.
- Ernährung / Diät: keine Diät ist einer anderen prinzipiell überlegen.
- Keine Diät passt für alle zu jeder Zeit - „one size fits all“ gibt es nicht.
- Rotieren der verschiedenen Diätformen ist empfehlenswert.
- An Genetik angepasste Diät bisher nicht wirksam. Technische Hilfsmittel?
- Langzeitresultate?
- Sarkopene Adipositas vermeiden.
- Tendenz zu sekundärer Gewichtszunahme: Gewichtserhaltung ist schwierig (noch schwieriger).