

Sinn und Unsinn von Diäten

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Medizinischer Sinn und Unsinn von Diäten

Gesund durch Ernährung – Was ist evidenzbasiert ?

Gewicht

Diabetes

Atherosklerose

Krebs

(Nahrungsmittelunverträglichkeiten)

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**Ausgesprochen
wenig harte Tatsachen
sind evidenzbasiert**

Lauter Experten ...

Die meisten Menschen denken, dass sie von
Ernährung viel verstehen.
Sie tun es ja von Geburt an mehrmals täglich.

- Diät

- Zeitlich begrenzte, meist einseitige Form der Ernährung mit einem spezifischen, kurz- bis mittelfristig erreichbaren Ziel

Der bei weitem häufigste Grund für eine Diät ist der Wunsch das Körpergewicht zu reduzieren !

- Ernährung

- Dauerhaft durchführbare Form der täglich notwendigen Zufuhr an Energie, Ballaststoffen, Mikronährstoffen, Vitaminen und Spurenelementen

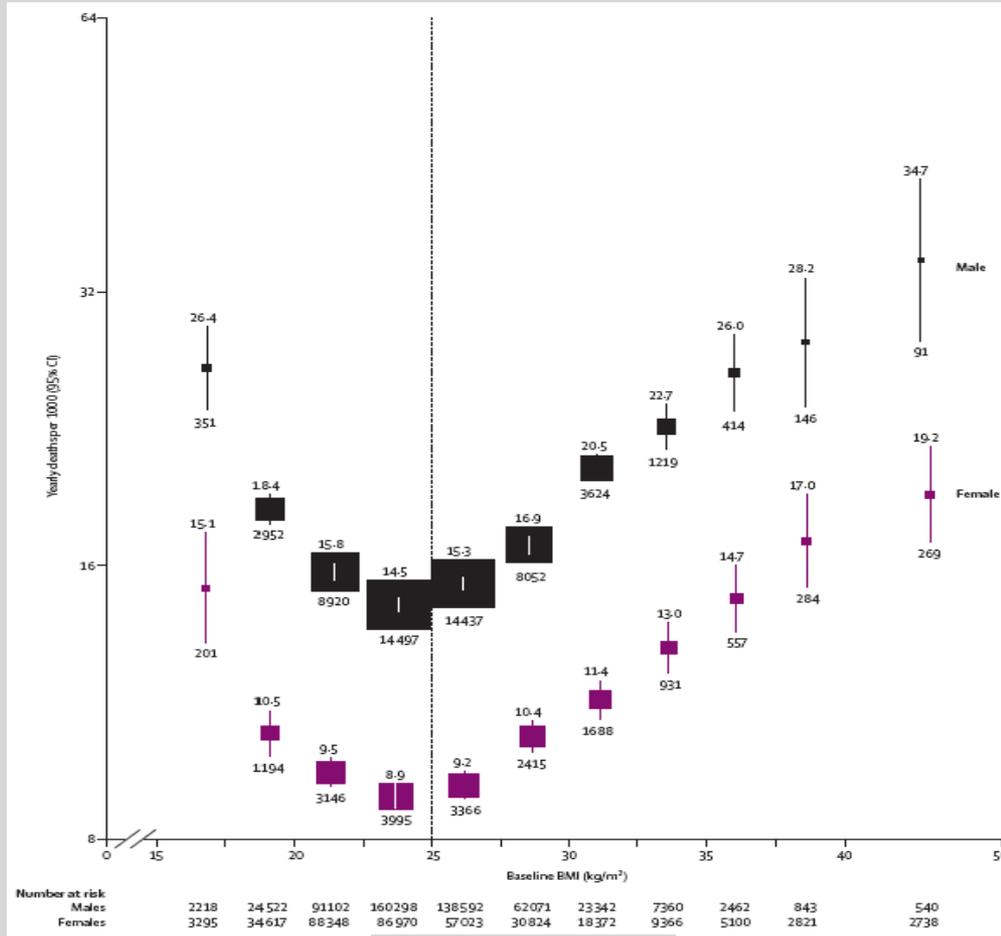
BMI und Mortalität: The Prospective Studies Collaboration

- 57 prospektive Studien
- 894.576 Teilnehmer
- 61% Männer, mittleres Alter 46 Jahre
- Mittleres Follow-up: 8 Jahre
- 66.552 Todesfälle

Prospective Studies Collaboration. Lancet 2009; 373:1083-96.

Gesamtsterblichkeit

Todesfälle / 10.000 / Jahr



Männer

Frauen

BMI (kg/m²)

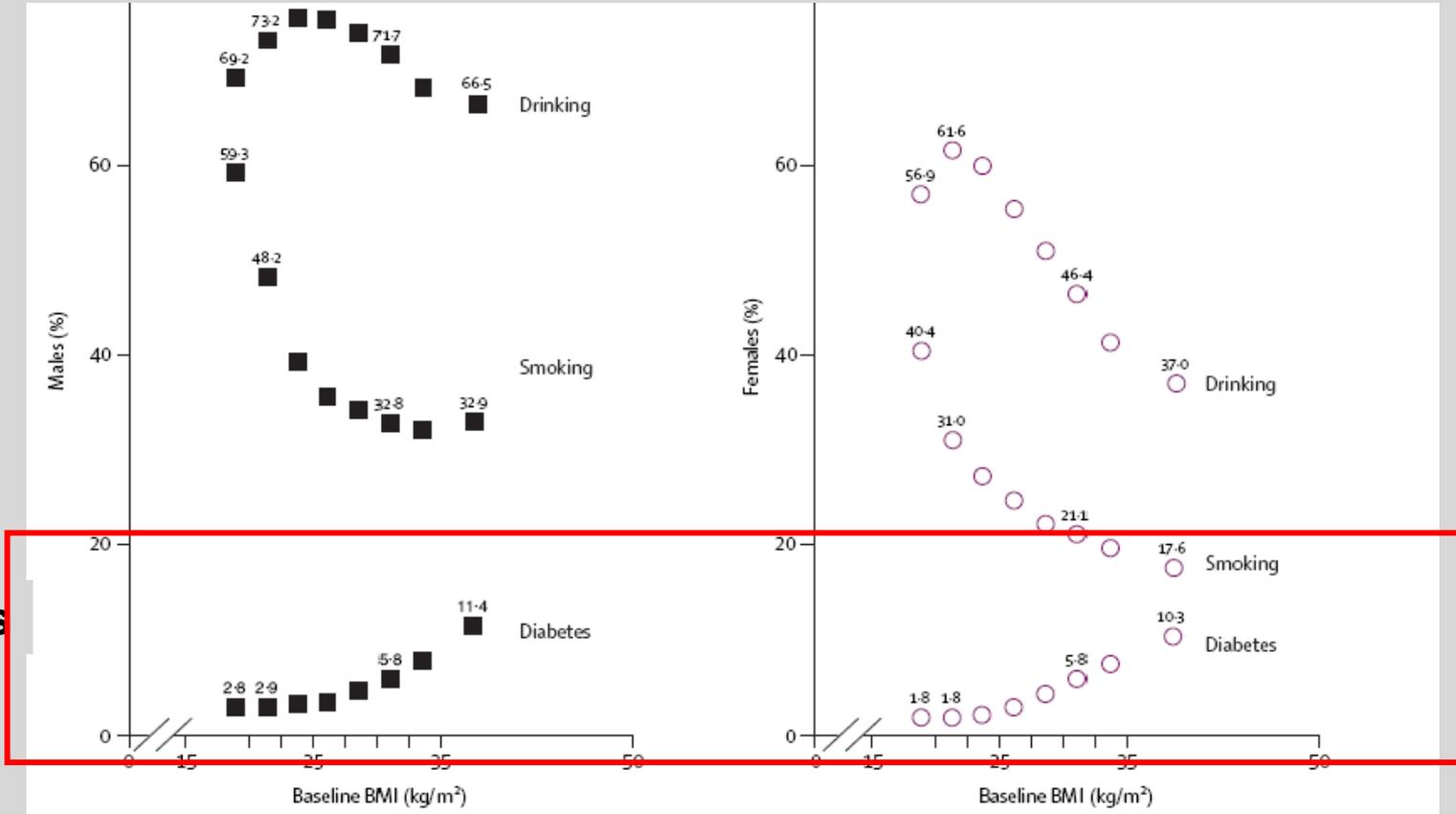
Adipositas und kardiovaskuläre Risikofaktoren

Männer

Fauen

Prävalenz (%)

Diabetes

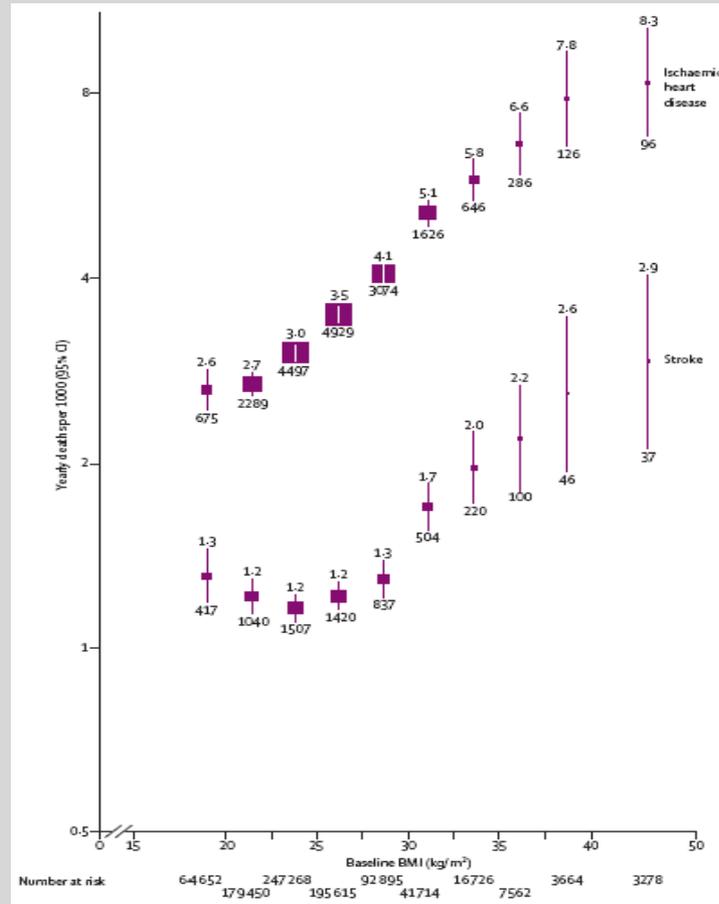


BMI (kg/m²)

BMI (kg/m²)

KHK und Schlaganfälle

Todesfälle / 10.000 / Jahr



BMI (kg/m²)

Adipositas und Krebs

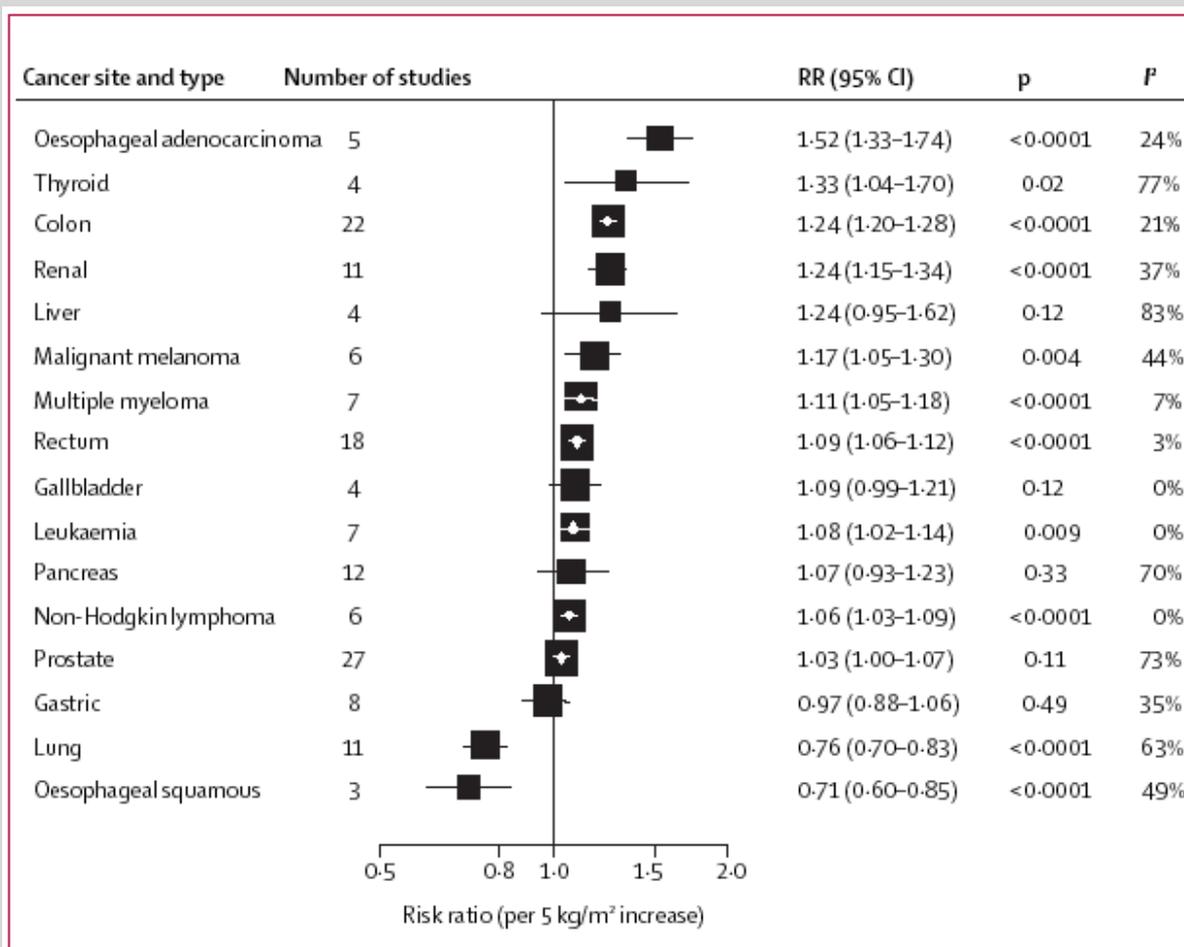


Figure 3: Summary risk estimates by cancer sites in men

Adipositas und Krebs

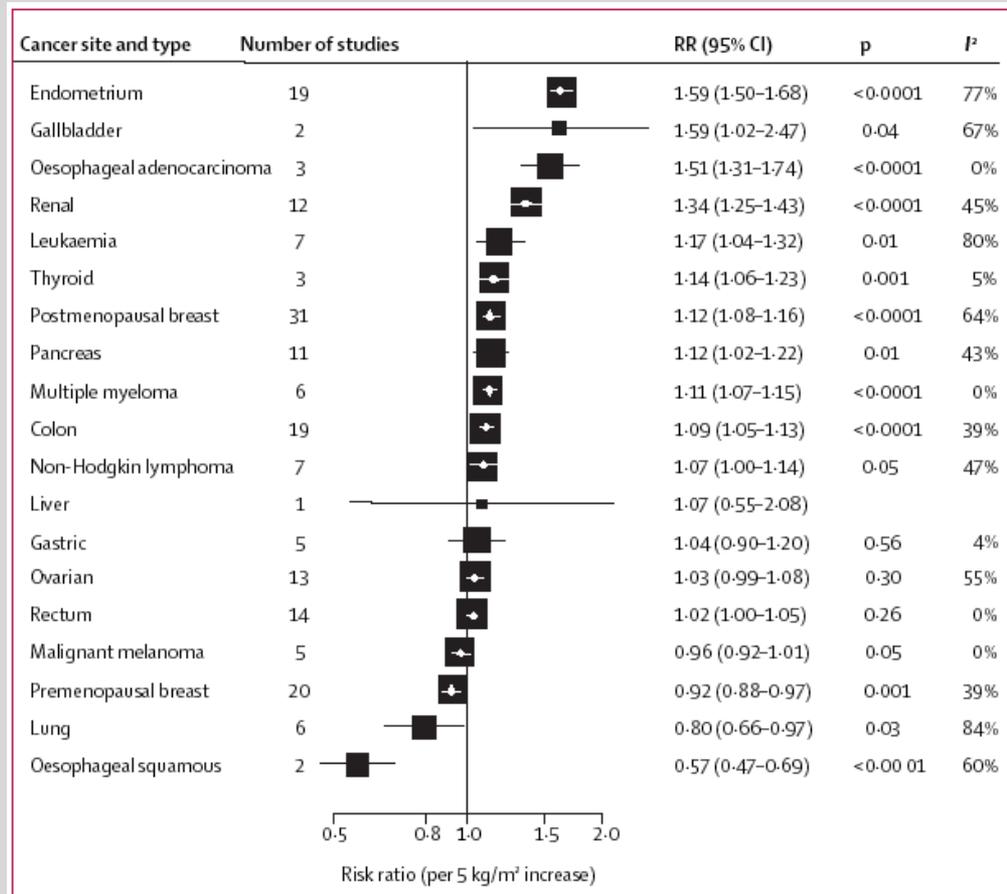


Figure 4: Summary risk estimates by cancer sites in women

- **BMI 30-35 kg/m²:**

- minus 2 bis 4 Jahre

Die meisten Diäten werden aus

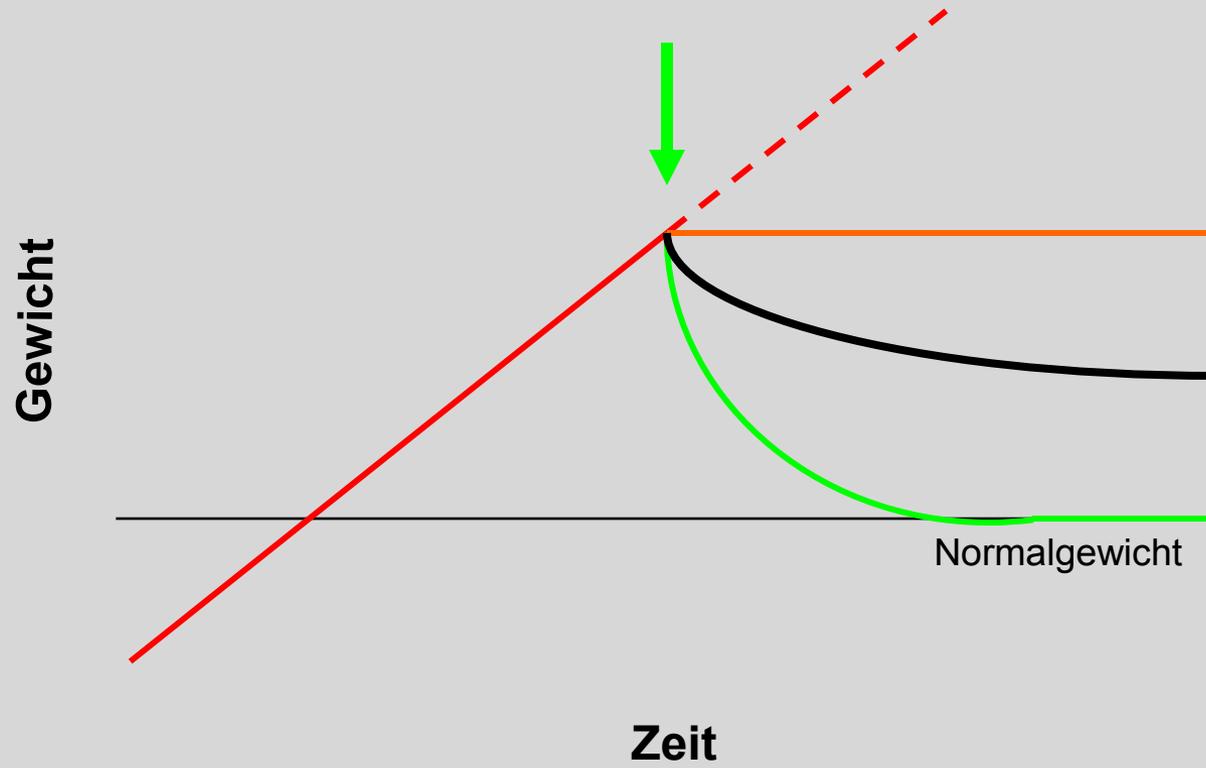
„kosmetischen“ Gründen

- **BMI 40-45 kg/m²:**

gemacht !

- minus 8-10 Jahre

Gewichtsverlauf: Erwartungen und Möglichkeiten



Prinzipien des Energiestoffwechsels

**Was reinkommt muss auch
wieder raus**

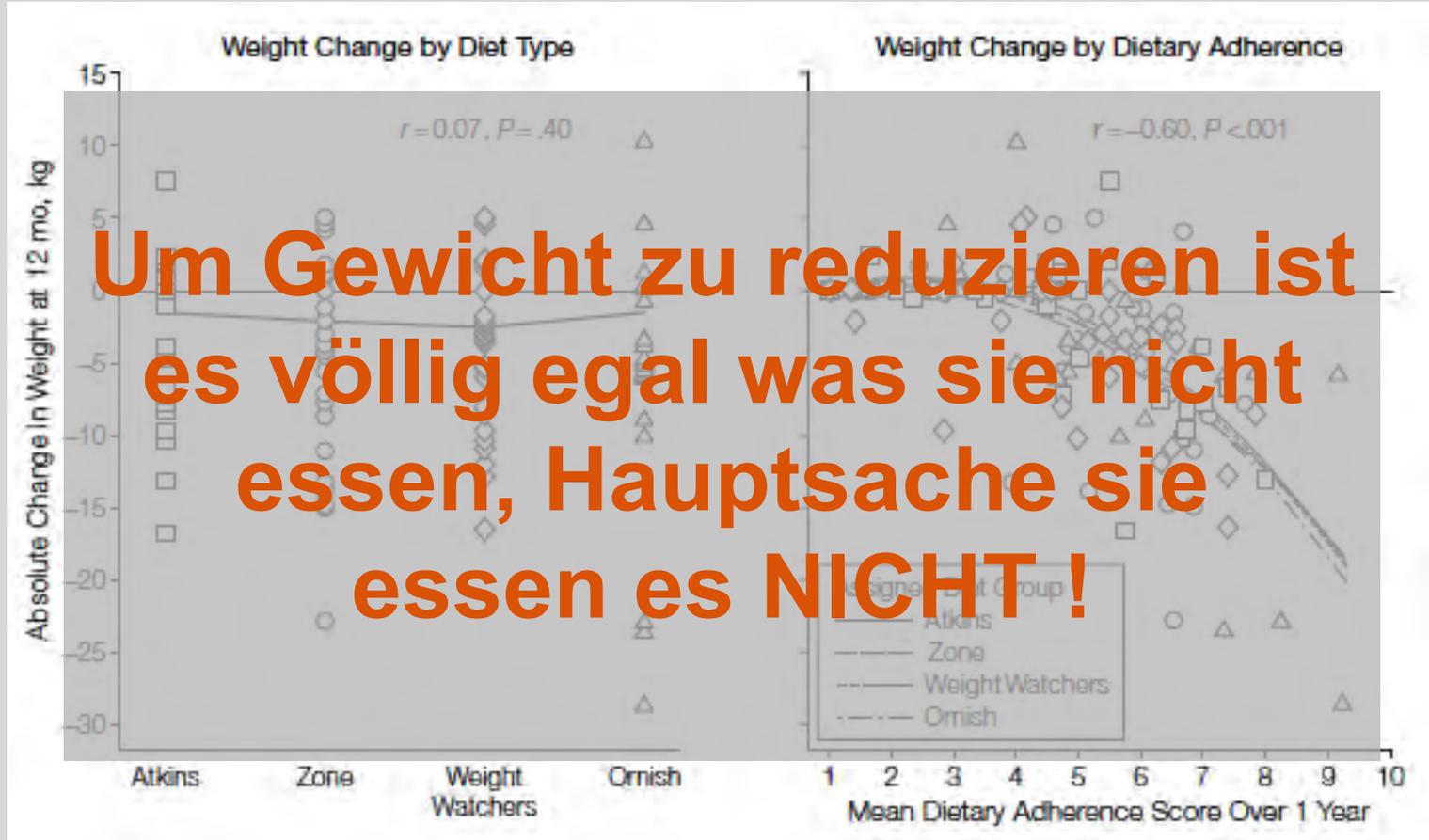
Obesity Is Caused by Long-Term Positive Energy Balance



Comparison of the Atkins, Ornish, Weight Watchers, and Zone Diets for Weight Loss and Heart Disease Risk Reduction

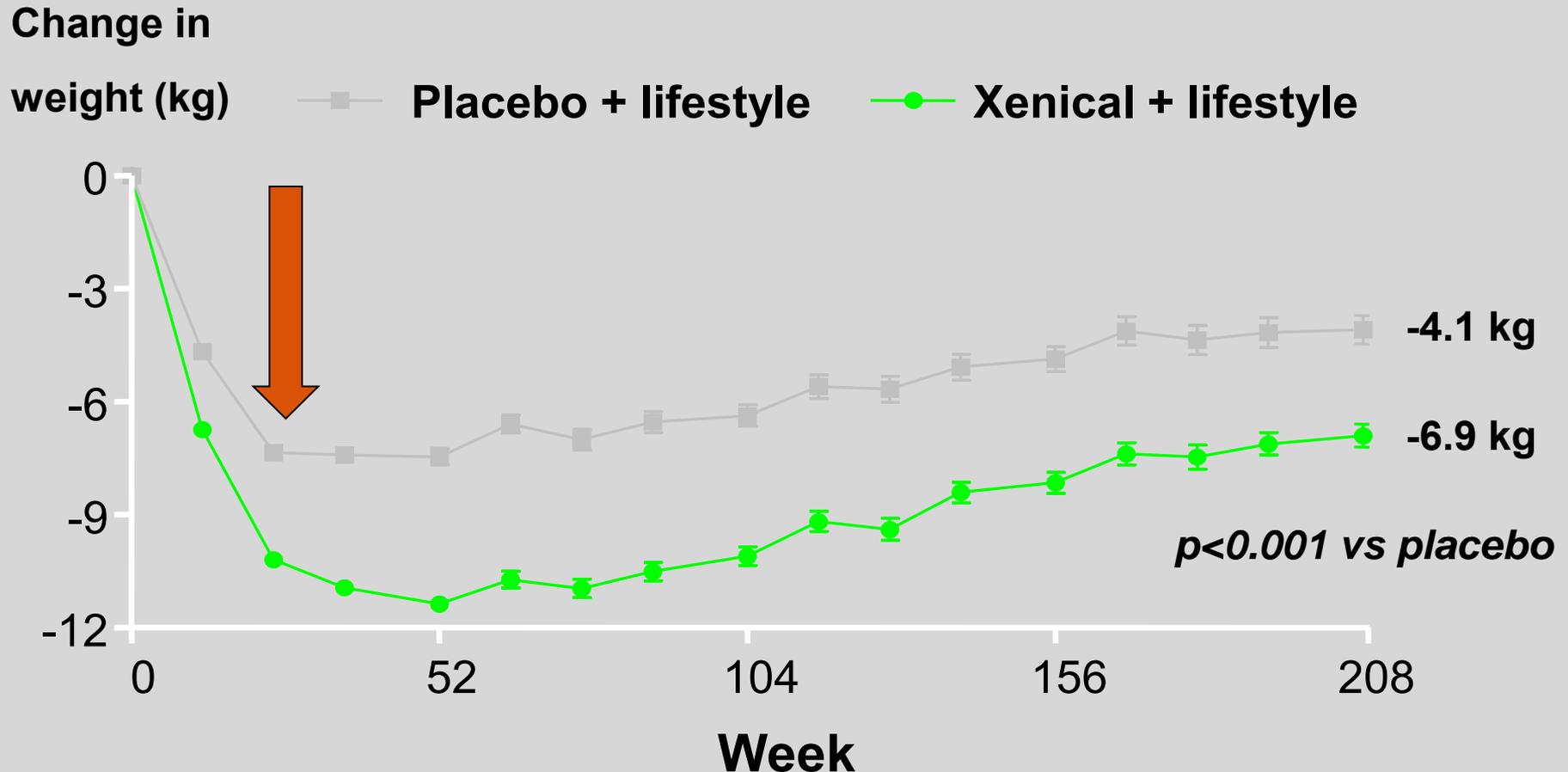
- Je 40 Patienten, randomisiert über 12 Monate
- Atkins: Low carb
- Ornish: Vegetarian, low fat
- Weight Watchers: Carb counting
- Zone: Macronutrient balance

Comparison of the Atkins, Ornish, Weight Watchers, and Zone Diets for Weight Loss and Heart Disease Risk Reduction



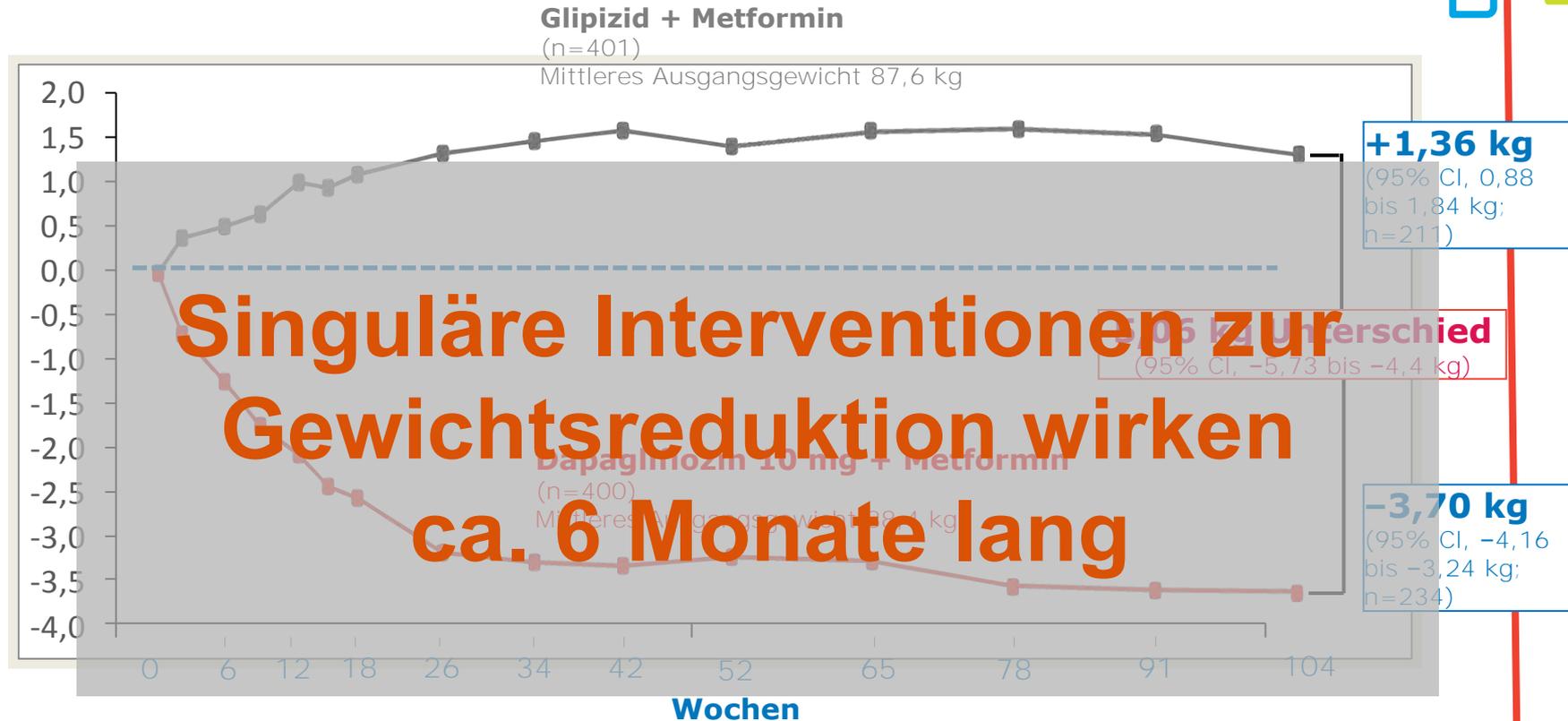
XENDOS results

Effect of Xenical on body weight



Gewichtsverlauf unter Therapie mit SH oder SGLT2 Hemmer

Adjustierte mittl. Änderung des Körpergewichts (kg)
im Vergleich zum Ausgangswert



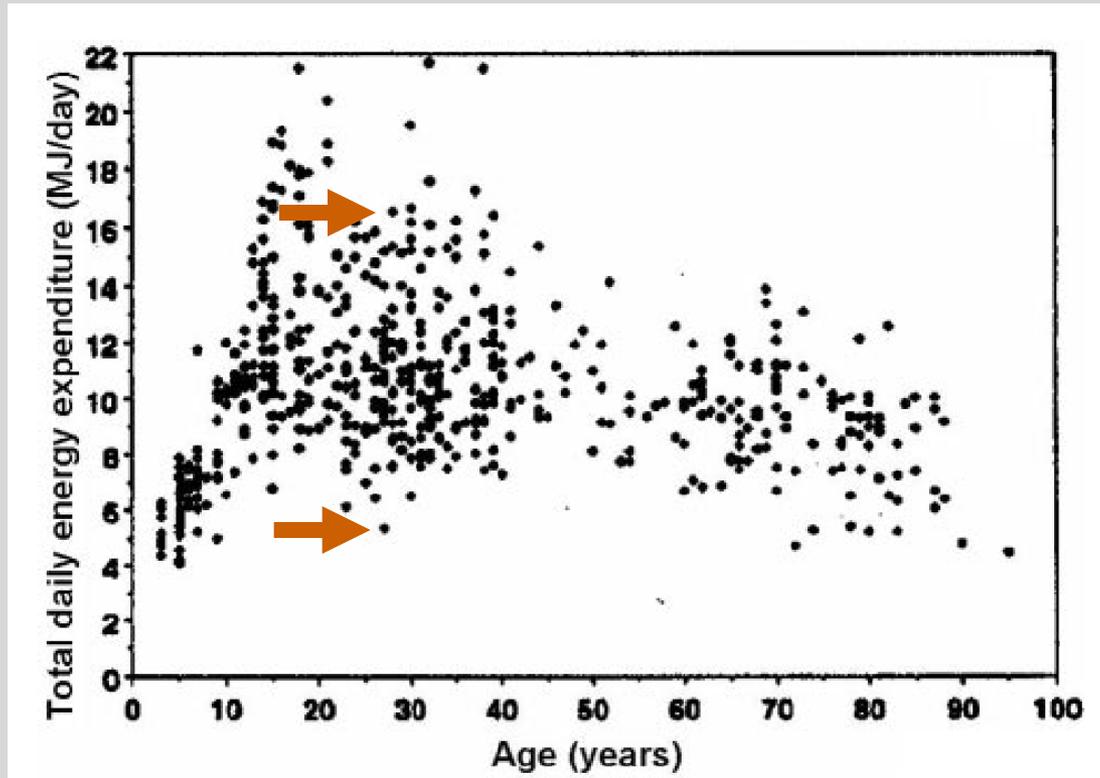
Verwendet wurden die adjustierten mittleren Veränderungen des Gewichts im Vergleich zum Ausgangswert, mit einem 95% CI, abgeleitet aus einer Analyse mit Messwiederholungen (repeated measures mixed model).

*** Dapagliflozin ist nicht indiziert für die Behandlung von Übergewicht. Gewichtsreduktion ist ein Zusatzeffekt und war ein sekundärer Endpunkt in klinischen Studien.**

CI: Konfidenzintervall

Energieverbrauch gesunder Probanden

n=547, doppelt markiertes Wasser



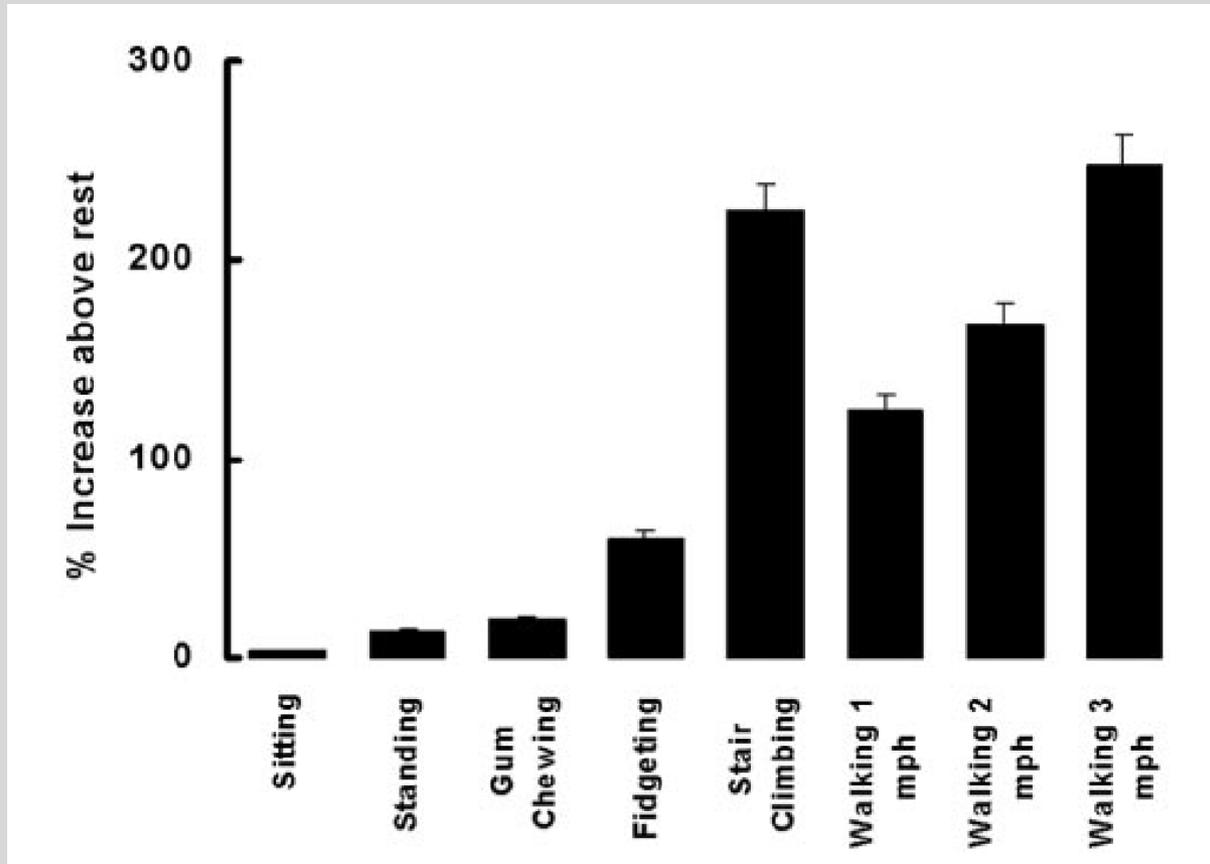
**5.5 vs 16.5
MJ/d
Faktor 3 !**

1 MJ = 238 kcal

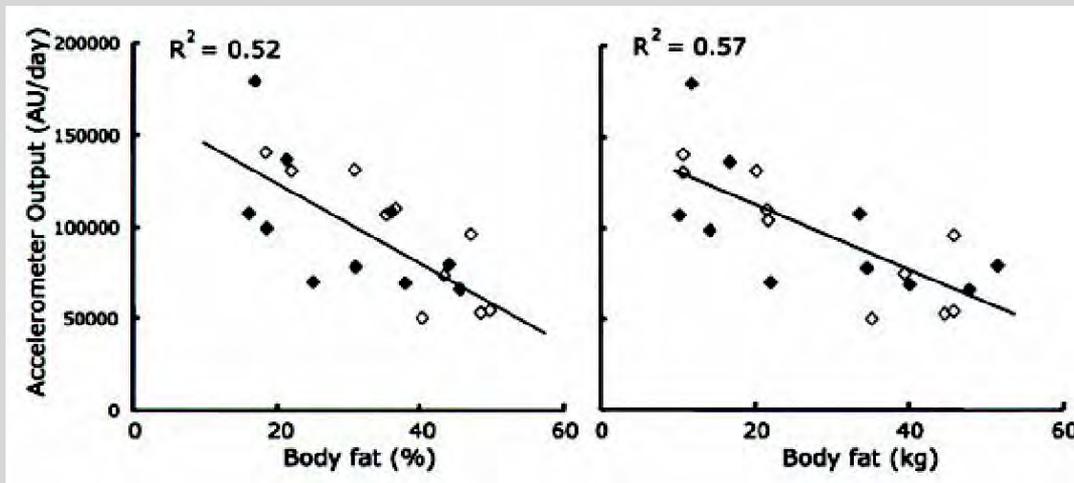
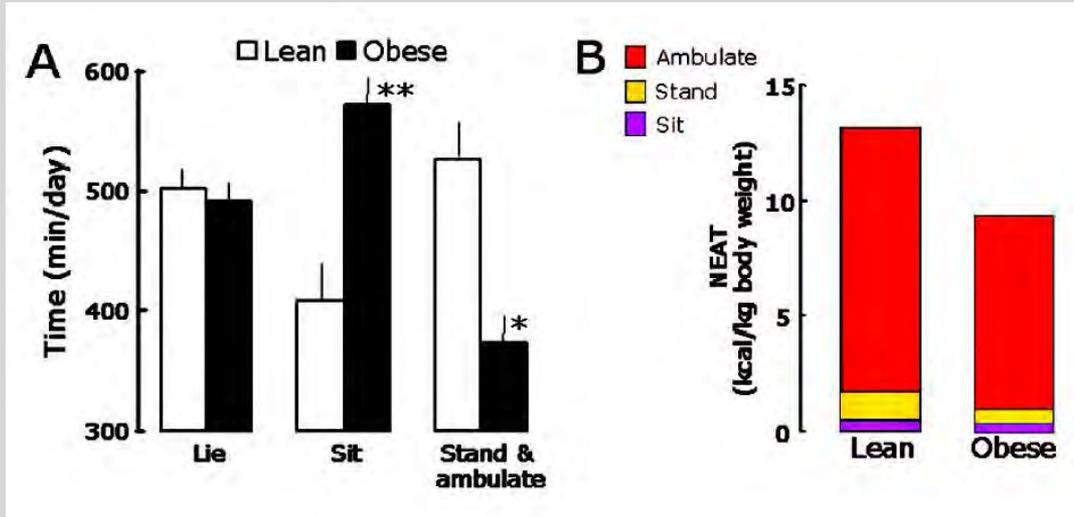
- Grundumsatz, BMR
 - Abhängig von Alter, Geschlecht, Muskelmasse
(Näherungsformel nach Harris & Benedict)
- nahrungsinduzierte Thermogenese
 - Nur sehr begrenzt variabel
- aktivitätsinduzierte Thermogenese
 - variable Komponente des Energieverbrauches

- NEAT
 - Non Exercise Activity Thermogenesis
 - Bewegung
- EAT
 - Exercise Activity Thermogenesis
 - Sport, Training

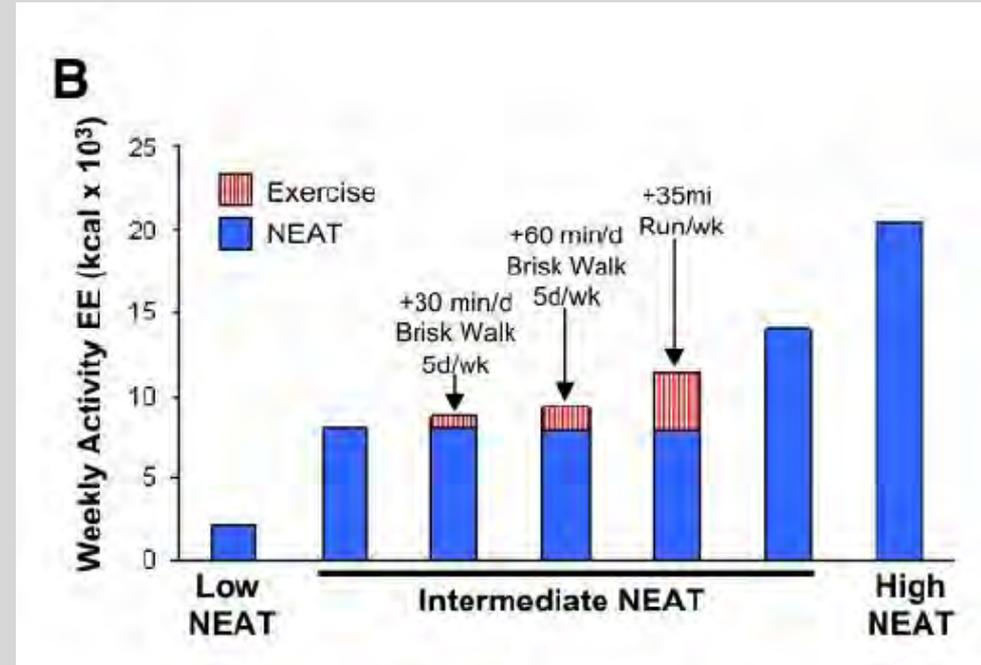
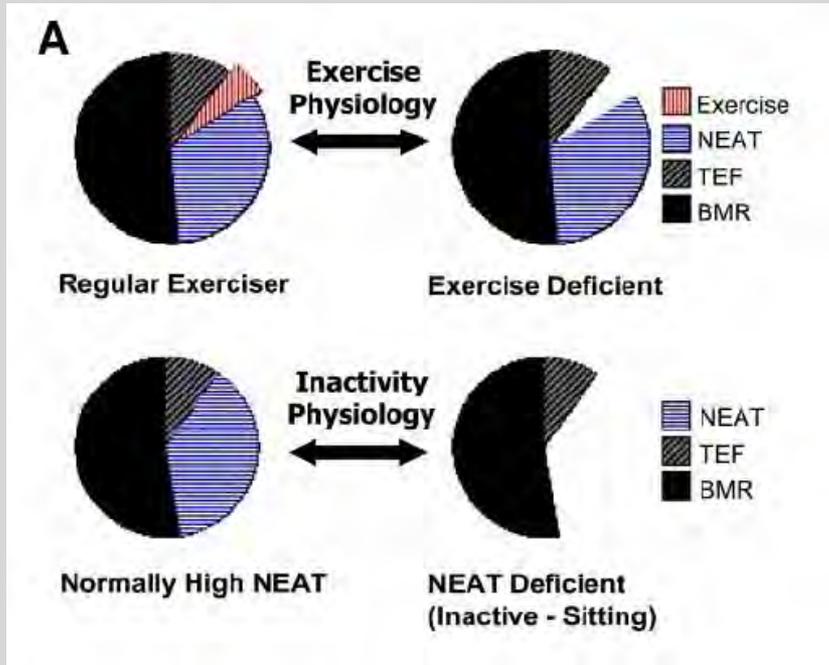
Steigerung des Energieverbrauches durch Aktivität



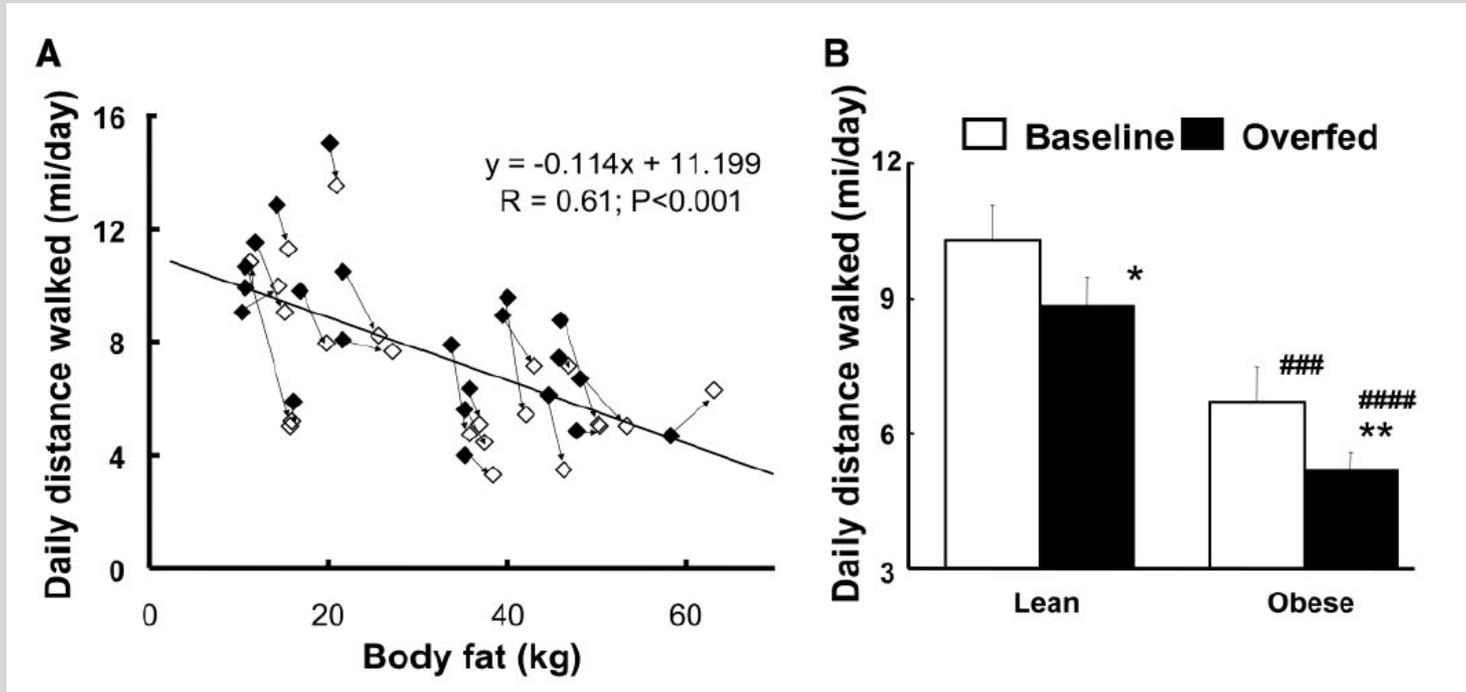
NEAT bei schlanken und adipösen Personen



NEAT Defizienz vs. EAT Defizienz

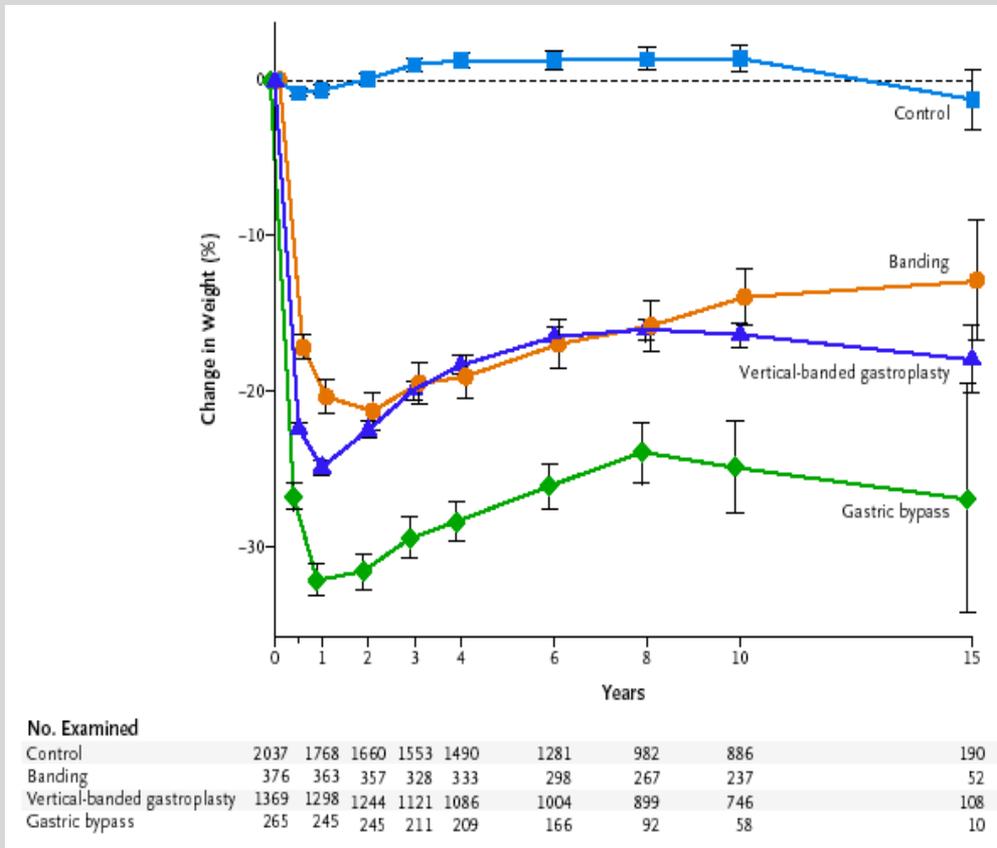


12 schlanke und 10 adipöse Personen, + 3,6 kg in 8 Wochen



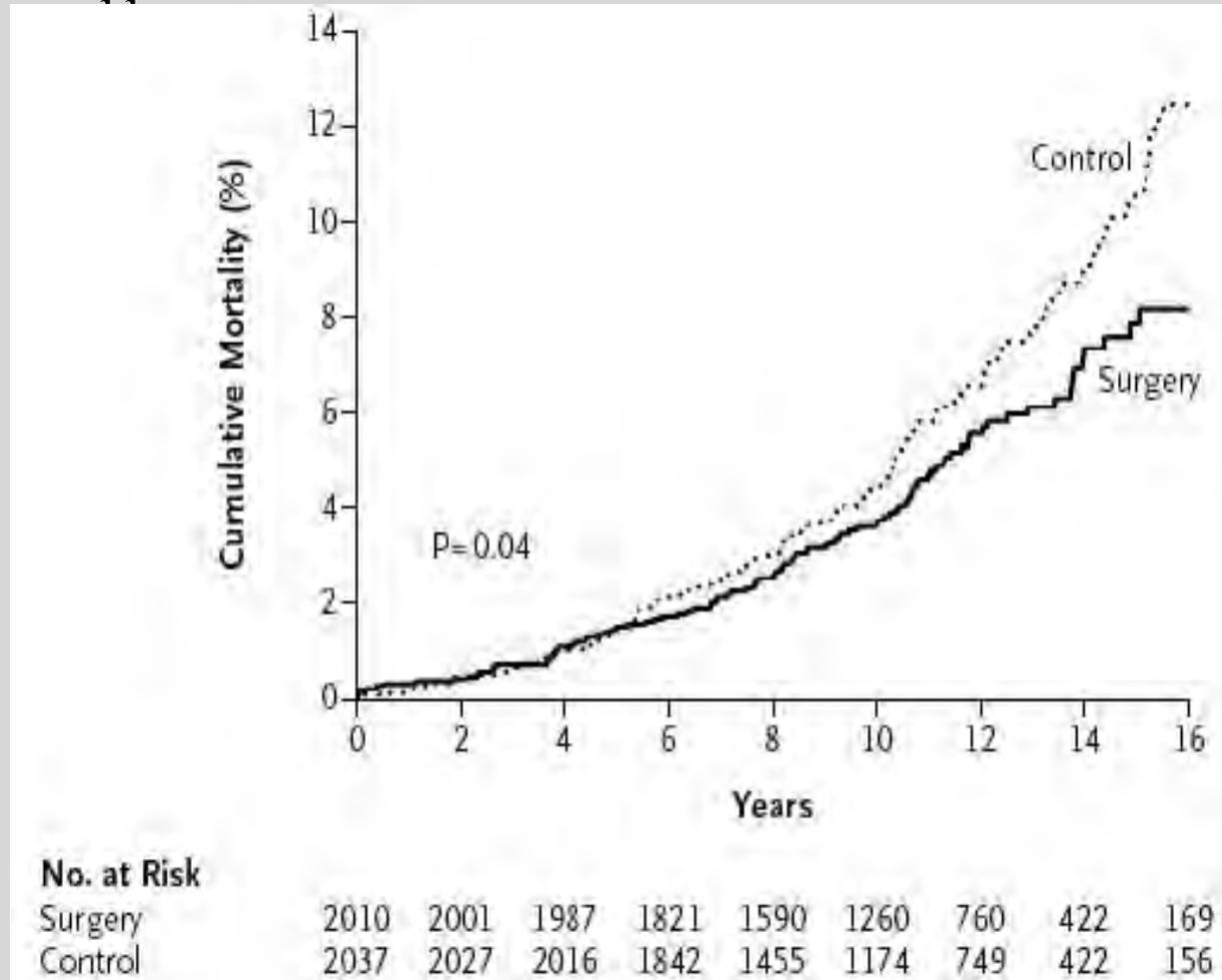
Effects of bariatric surgery on mortality in swedish obese subjects

4047 subjects, mean age 47 years, BMI 42 kg/m², mean follow up 11 years



Effects of bariatric surgery on mortality in swedish obese subjects

4047 subjects, mean age 47 years, BMI 42 kg/m², mean follow up



RR 0.76

No perioperative deaths

Control: 129 deaths

Surgery: 101 deaths

90-day mortality

Control: 2 deaths

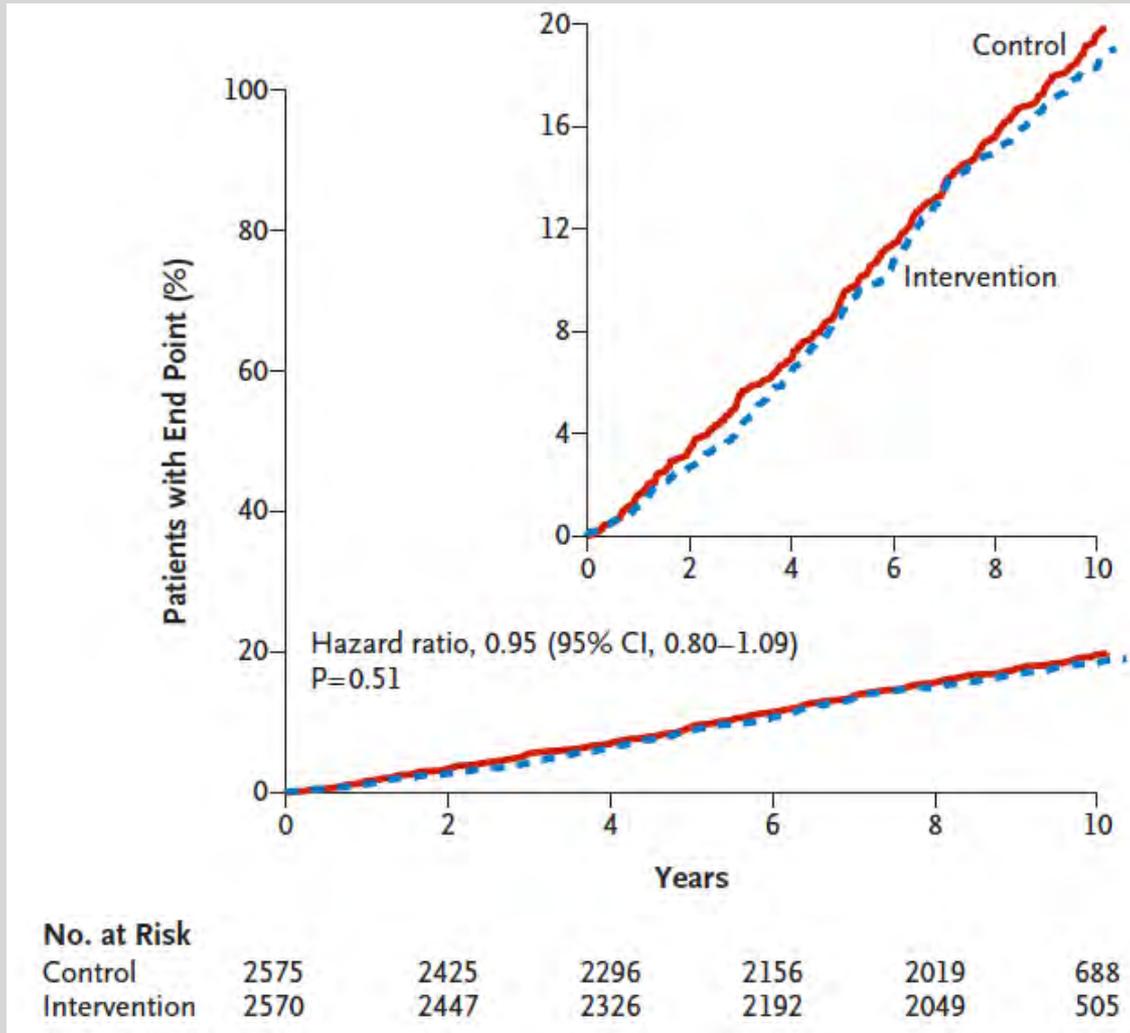
Surgery: 5 deaths

**Bei morbider Adipositas reduziert
eine chirurgische Intervention die
Mortalität und Morbidität**

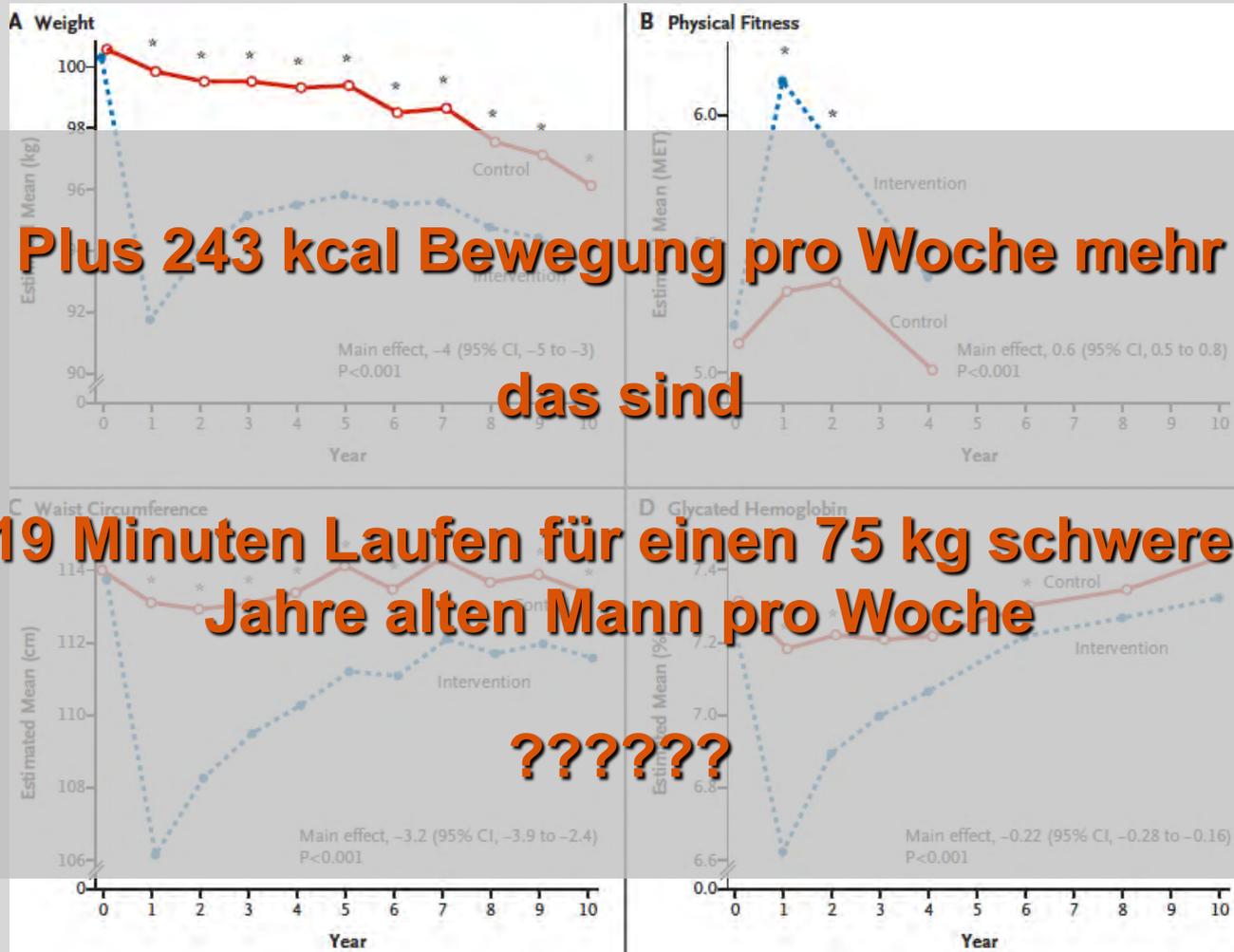
Look Ahead: Lebensstilintervention bei DM-2

- Lebensstilintervention mit dem Ziel „Gewichtsverlust und Bewegung“
- Makro- und Mikrovaskuläre Endpunkte
- Ziel: -10 % Körpergewicht, 175 min Exercise, 10.000 Schritte/Tag
- Population
 - DM-2 mit und ohne Insulin (14% mit bekannter KHK), mittlere Dauer 5 J
 - n= 5145
 - Alter 59 Jahre
 - BMI 36 kg/m²
- Primärer Endpunkt:
 - CVD Tod, Infarkt, Schlaganfall, Hospitalisierung wegen Angina pect.

Look Ahead: Lebensstilintervention bei DM-2



Look Ahead: Lebensstilintervention bei DM-2



**Plus 243 kcal Bewegung pro Woche mehr
das sind**

**ca. 19 Minuten Laufen für einen 75 kg schweren 50
Jahre alten Mann pro Woche**

??????

Lebensstilintervention wirkt nicht Look Ahead hat es bewiesen

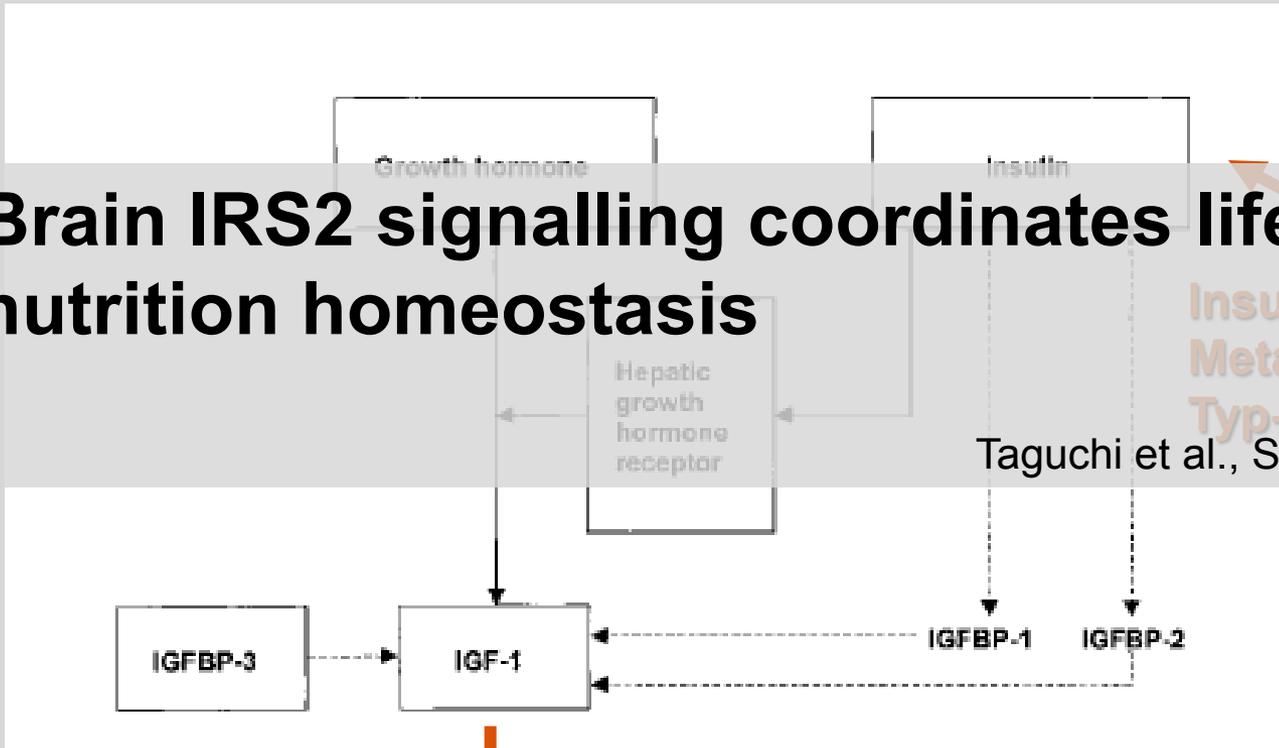
- Das ist argumentativ so wie einem Hypertoniker ein Antihypertensivum zu verschreiben
- Der nimmt dann das Medikament nicht
- Der Blutdruck sinkt daher nicht
- Und wir glauben das Medikament taugt nichts

- Energiebilanz
- Makronährstoffe
 - Verteilung Fett-KH-Protein
 - Spezifische Zusammensetzung
- Mikronährstoffe

Brain IRS2 signalling coordinates lifespan and nutrition homeostasis

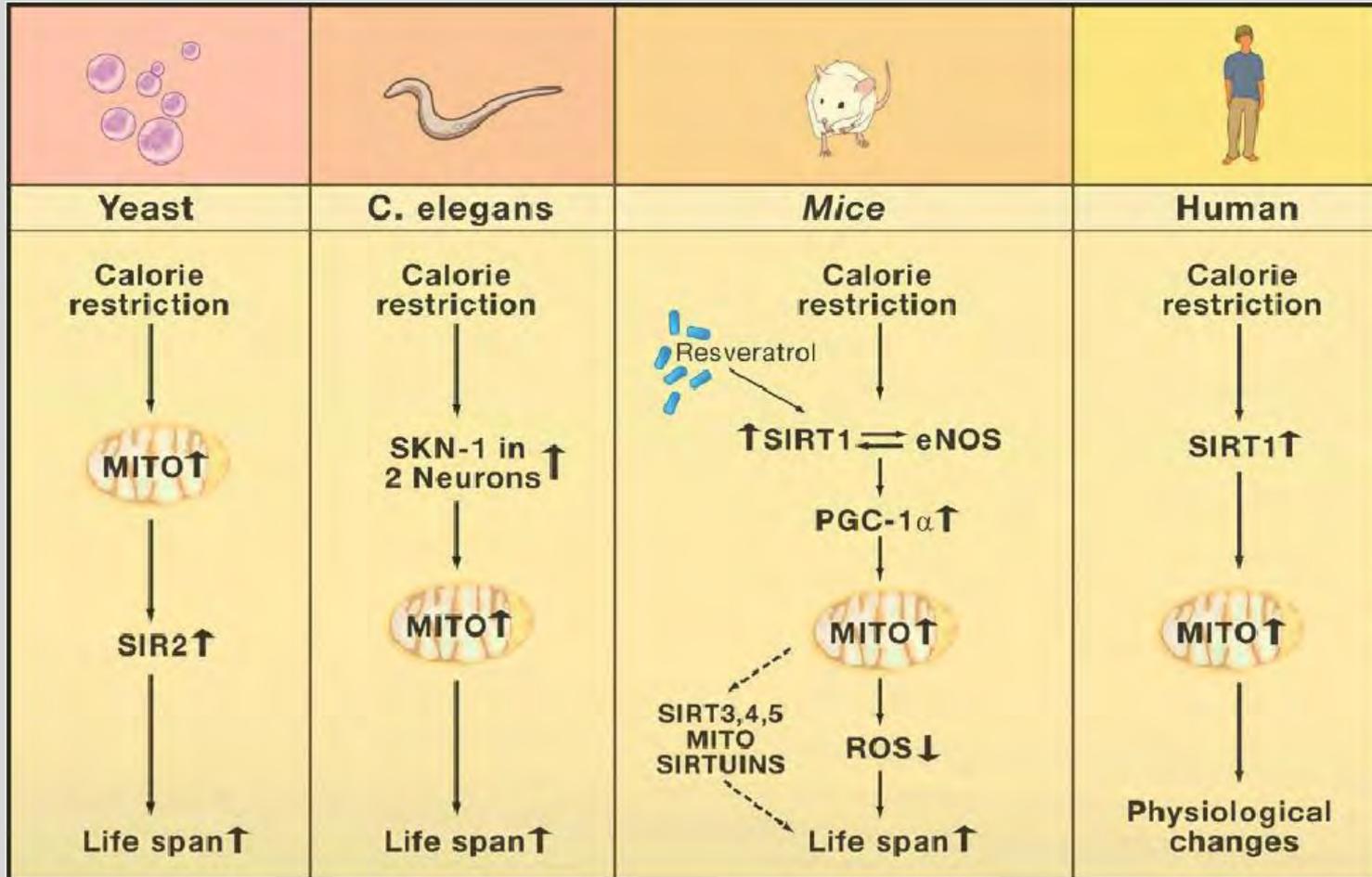
Insulinresistenz
Metabolisches Syndrom
Typ-2 Diabetes

Taguchi et al., Science, July 20, 2007

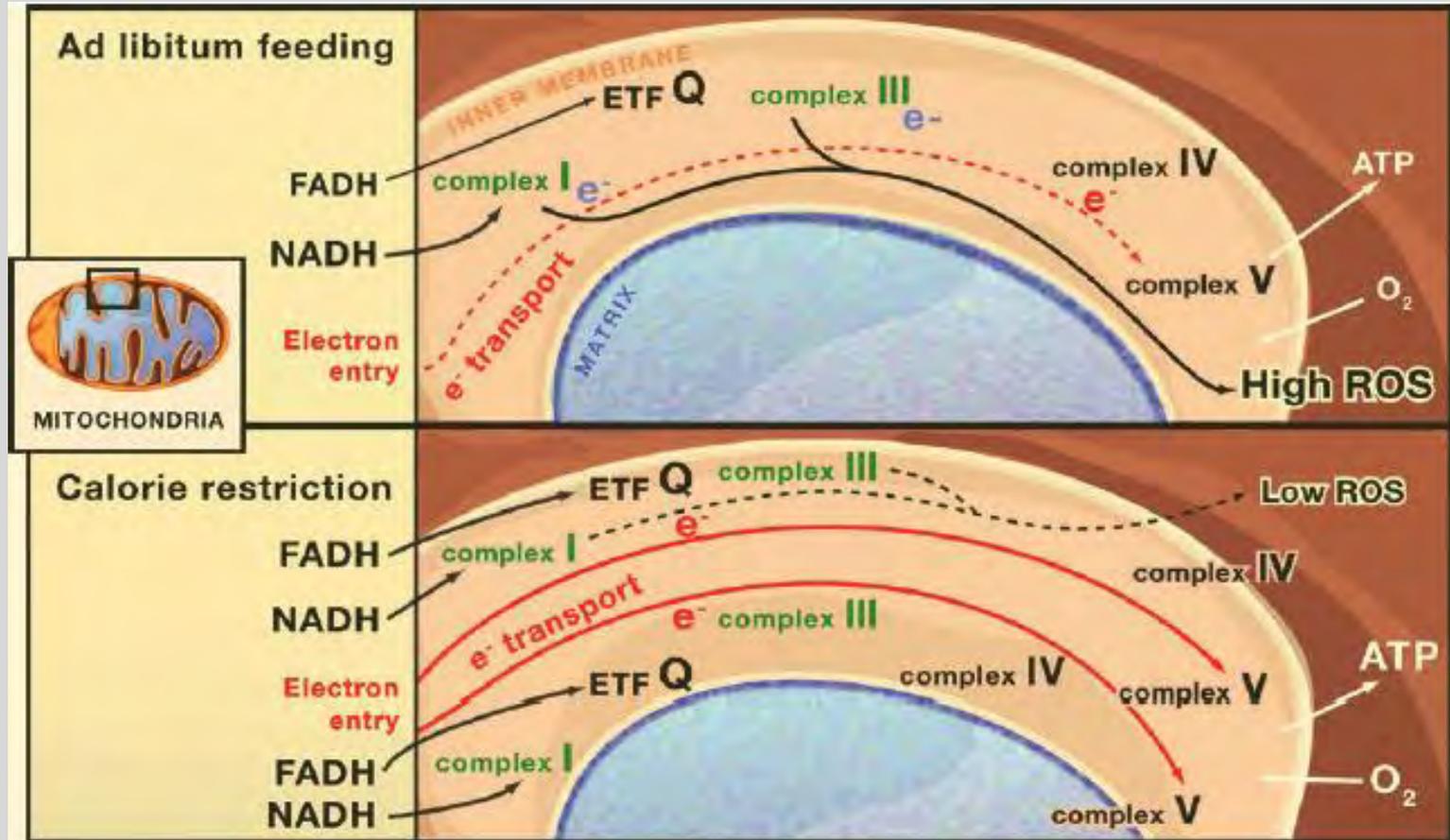


Altern

Mitochondria—A Nexus for Aging, Calorie Restriction, and Sirtuins?



Mitochondria—A Nexus for Aging, Calorie Restriction, and Sirtuins?



- Energiebilanz
 - **Überernährung fördert Diabetes, Atherosklerose und Krebs**
 - **Kalorienrestriktion verlängert zumindest experimentell die Lebensdauer unterschiedlicher Spezies**

Makronährstoffe regulieren Genexpression

- Arbeitsgruppe an der NTNU Trondheim (Berit Johansen)
- Übergewichtige Personen isokalorisch mit unterschiedlichen Nahrungszusammensetzungen ernährt
- High carb: starke Hochregulierung proinflammatorischer Gene
- Low carb: Hochregulierung proinflammatorischer Gene
- Im Vergleich zu 35 % carb

Low-carbohydrate diets and all-cause and cause-specific mortality: Two cohort Studies

- Nurses Health Study
- Health Professionals' Follow up Study

Results—The overall low-carbohydrate score was associated with a modest increase in overall mortality in pooled analysis (Hazard Ratio, HR, comparing extreme deciles=1.12 (95% CI=1.01-1.24, p-trend=0.14). The animal low-carbohydrate score was associated with a higher all-cause mortality (pooled HR comparing extreme deciles=1.23, 95% CI=1.11-1.37, p-trend=0.05), cardiovascular mortality (corresponding HR=1.14, 95% CI=1.01-1.29, p-trend=0.029), and cancer mortality (corresponding HR=1.28, 95% CI 1.02-1.60, p for trend = 0.09). In contrast, a higher vegetable low-carbohydrate score was associated with lower all-cause (HR=0.80, 95% CI=0.75-0.85, p-trend<0.001) and cardiovascular mortality (HR=0.77, 95% CI=0.68-0.87, p-trend<0.001).

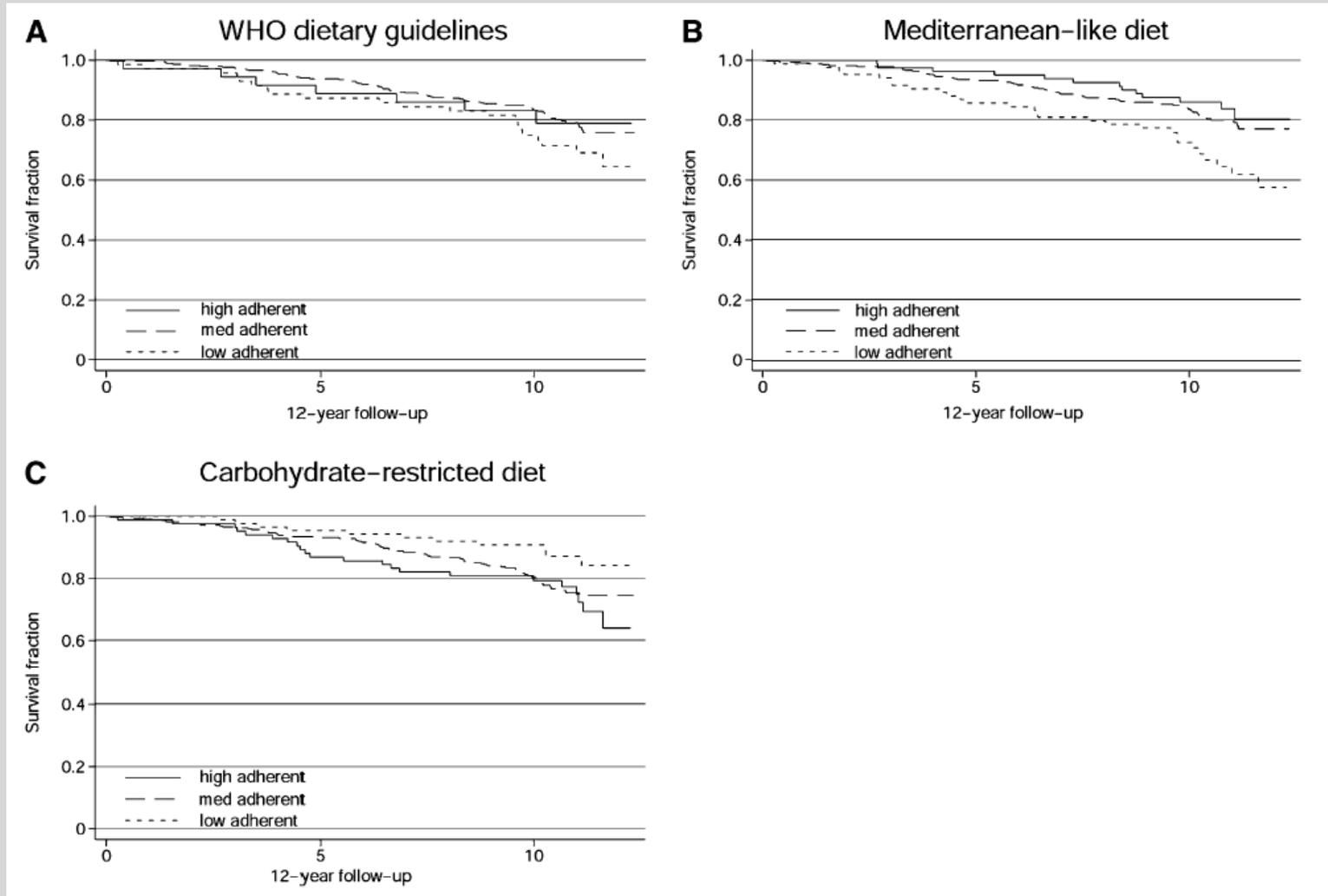
	Cutoff scoring	Points
HDI²		
SFAs	0–12% of energy	1
PUFAs	5–10% of energy	1
Protein	10–20% of energy	1
Total carbohydrates	50–70% of energy	1
Sucrose	>10% of energy	-1
Fiber	≥3 g/MJ	1
Fruit and vegetables	>400 g/d	1
Cholesterol	0–300 mg/d	1
Fish	≥35 g/d	1
Range	—	-1 to 8
MDS³		
PUFAs/SFAs	>Median	1
Vegetables and legumes	>Median	1
Fruit	>Median	1
Cereals and potatoes	>Median	1
Fish	>Median	1
Meat and meat products	<Median	1
Milk and milk products	<Median	1
Alcohol	Moderate	1
Range	—	0–8
CR diet		
Carbohydrate intake	Lowest to highest decile	10 to 1
Protein intake	Lowest to highest decile	1 to 10
Range	—	2–20

	Total mortality		CVD mortality	
	Model 1 ²	Model 2 ³	Model 1 ²	Model 2 ³
HDI: continuous (SD increment)	0.96 (0.78, 1.19)	0.96 (0.77, 1.19)	0.99 (0.72, 1.37)	1.07 (0.77, 1.49)
Grouped as				
Low (-1 to 1 points)	Ref	Ref	Ref	Ref
Medium (2-4 points)	0.80 (0.53, 1.21)	0.76 (0.49, 1.17)	0.50 (0.28, 0.90)	0.53 (0.28, 1.00)
High (5-8 points)	0.95 (0.53, 1.70)	0.95 (0.51, 1.75)	1.03 (0.48, 2.21)	1.25 (0.55, 2.80)
<i>P</i> for trend ⁴	0.76	0.76	0.88	0.67
MDS: continuous (SD increment)	0.82 (0.69, 0.97)	0.83 (0.70, 0.99)	0.86 (0.66, 1.12)	0.93 (0.70, 1.22)
Grouped as				
Low (0-2 points)	Ref	Ref	Ref	Ref
Medium (3-5 points)	0.74 (0.54, 1.01)	0.73 (0.52, 1.00)	0.75 (0.46, 1.23)	0.82 (0.49, 1.38)
High (6-8 points)	0.55 (0.33, 0.92)	0.56 (0.33, 0.96)	0.55 (0.24, 1.23)	0.60 (0.26, 1.38)
<i>P</i> for trend ⁴	0.013	0.018	0.12	0.22
CR diet score: continuous (SD increment)	1.11 (0.97, 1.27)	1.11 (0.96, 1.28)	1.13 (0.91, 1.40)	1.07 (0.86, 1.34)
Grouped as				
Low (2-6 points)	Ref	Ref	Ref	Ref
Medium (7-15 points)	1.32 (0.88, 1.98)	1.28 (0.84, 1.95)	1.53 (0.78, 2.99)	1.39 (0.71, 2.75)
High (16-20 points)	1.25 (0.76, 2.06)	1.22 (0.73, 2.05)	1.28 (0.56, 2.93)	1.06 (0.45, 2.50)
<i>P</i> for trend ⁴	0.41	0.47	0.61	0.94

¹ Risk estimates are presented as hazard ratios (95% CIs) derived by Cox proportional hazards regression analyses. CVD, cardiovascular disease; HDI, Healthy Diet Indicator; MDS, Mediterranean Diet Score; CR, carbohydrate restricted; Ref, reference.

² Adjusted for energy intake, smoking, and social class; *n* = 904.

³ Adjusted as for model 1 plus type 2 diabetes, the metabolic syndrome, lipid-lowering treatment, blood pressure-lowering treatment, waist circumference, diastolic blood pressure, insulin, and C-reactive protein; *n* = 871.



Mediterranean Dietary Pattern and Prediction of All-Cause Mortality in a US Population

- N=380296, FU 10 Jahre, 27799 Todesfälle

Table 4. Results of Statistical Analysis for the Mediterranean Dietary Pattern (aMED) and Cause-Specific Mortality^a

Characteristic	aMED Score				P Value for Trend	aMED Score				P Value for Trend
	Men (n=214 284)			P Value for Trend		Women (n=166 012)			P Value for Trend	
	0-3	4-5	6-9			0-3	4-5	6-9		
Cancer										
Cases, No.	1608	1346	763			919	921	428		
Age-adjusted rates ^b	409.2	284.0	234.9			295.5	233.6	196.3		
Age-adjusted HR	1 [Reference]	0.69 (0.65-0.75)	0.57 (0.53-0.63)	<.001		1 [Reference]	0.79 (0.72-0.87)	0.67 (0.60-0.75)	<.001	
Multivariate HR ^c	1 [Reference]	0.84 (0.78-0.91)	0.79 (0.73-0.87)	<.001		1 [Reference]	0.92 (0.83-1.01)	0.86 (0.76-0.97)	.01	
Multivariate HR ^d	1 [Reference]	0.86 (0.80-0.93)	0.83 (0.76-0.91)	<.001		1 [Reference]	0.93 (0.85-1.02)	0.88 (0.78-1.00)	.04	
Cardiovascular Disease										
Cases, No.	1012	952	461			446	400	180		
Age-adjusted rates ^b	257.9	201.0	142.3			144.5	101.3	82.2		
Age-adjusted HR	1 [Reference]	0.78 (0.71-0.85)	0.55 (0.49-0.61)	<.001		1 [Reference]	0.70 (0.61-0.80)	0.57 (0.48-0.67)	<.001	
Multivariate HR ^c	1 [Reference]	0.94 (0.86-1.03)	0.76 (0.68-0.85)	<.001		1 [Reference]	0.85 (0.74-0.97)	0.79 (0.66-0.95)	.01	
Multivariate HR ^d	1 [Reference]	0.95 (0.86-1.04)	0.78 (0.69-0.87)	<.001		1 [Reference]	0.85 (0.74-0.98)	0.81 (0.68-0.97)	.01	
Other Causes										
Cases, No.	761	657	329			421	354	147		
Age-adjusted rates ^b	193.8	138.8	101.1			135.9	89.8	67.6		
Age-adjusted HR	1 [Reference]	0.72 (0.65-0.80)	0.52 (0.46-0.60)	<.001		1 [Reference]	0.66 (0.57-0.76)	0.50 (0.41-0.60)	<.001	
Multivariate HR ^c	1 [Reference]	0.88 (0.79-0.98)	0.74 (0.65-0.85)	<.001		1 [Reference]	0.81 (0.70-0.94)	0.70 (0.58-0.86)	<.001	
Multivariate HR ^d	1 [Reference]	0.90 (0.81-1.00)	0.77 (0.70-0.88)	<.001		1 [Reference]	0.82 (0.71-0.95)	0.72 (0.59-0.87)	<.001	

Mediterranean Diet, Lifestyle Factors, and 10-Year Mortality in Elderly European Men and Women

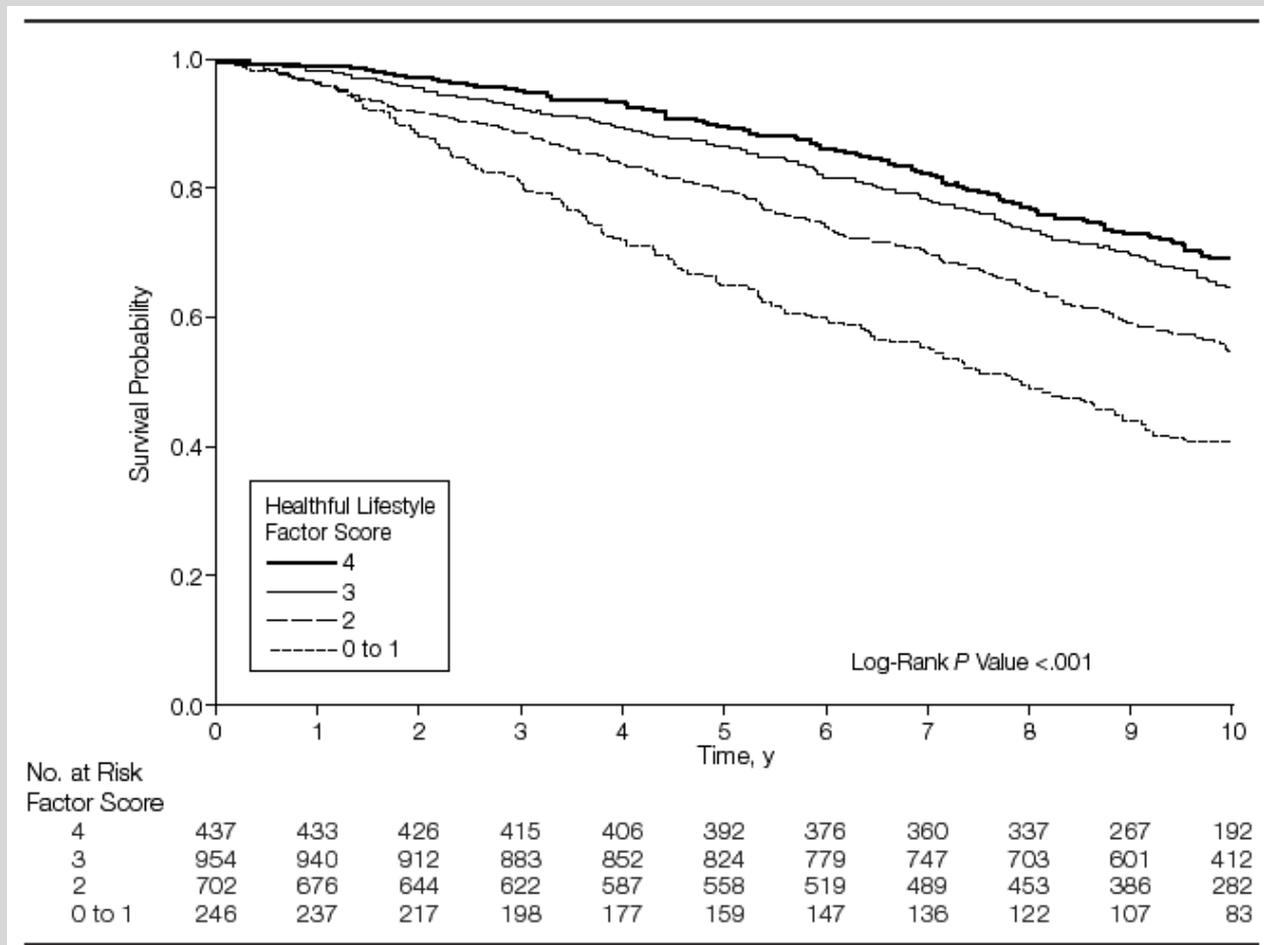
The HALE Project

Variables	Causes of Death, Hazard Ratio (95% Confidence Interval)*				
	All Causes	Coronary Heart Disease	Cardiovascular Disease	Cancer	Other Causes
No. at risk	2339	2152	2152	2152	2145
No. of events	935	122	371	233	145
Protective factors†					
Mediterranean diet	0.77 (0.68-0.88)	0.61 (0.43-0.88)	0.71 (0.58-0.88)	0.90 (0.70-1.17)	0.61 (0.44-0.85)
Moderate alcohol consumption	0.78 (0.67-0.91)	0.60 (0.40-0.88)	0.74 (0.59-0.93)	0.73 (0.54-0.98)	0.63 (0.44-0.90)
Physical activity	0.63 (0.55-0.72)	0.72 (0.48-1.07)	0.65 (0.52-0.81)	0.64 (0.48-0.84)	0.52 (0.37-0.74)
Nonsmoking	0.65 (0.57-0.75)	0.80 (0.54-1.17)	0.68 (0.54-0.85)	0.47 (0.36-0.62)	0.92 (0.59-1.24)

*Model adjusted for the other dietary and lifestyle factors, age, sex, number of years of education, body mass index, and study.
†To achieve protective factors in each category, participants must have scored at least 4 points for the Mediterranean diet score, consumed more than 0 g of alcohol a day, scored in the intermediate or highest tertile for either the Vooorrips or Morris questionnaires, and were nonsmokers or had quit smoking for at least 15 years.

Mediterranean Diet, Lifestyle Factors, and 10-Year Mortality in Elderly European Men and Women

The HALE Project



- Makronährstoffe
 - Verteilung Fett-KH-Protein
 - **Low carb ist nicht wirklich gesundheitsfördernd**
 - **High carb ?**
 - Spezifische Zusammensetzung
 - **Die beste Evidenz hinsichtlich krankheitsspezifischer Mortalität ist für das Einhalten einer mediterranen Ernährungsform verfügbar**

Conclusions: The limitations of both the indices and the studies that use them need to be considered when interpreting and comparing results. However, diet quality indices do appear to be able to quantify risk of some health outcomes, including biomarkers of disease and risk of CVD, some cancers and mortality. Further research is needed to improve the validity of these tools and to adapt them for use in clinical dietetic practice.

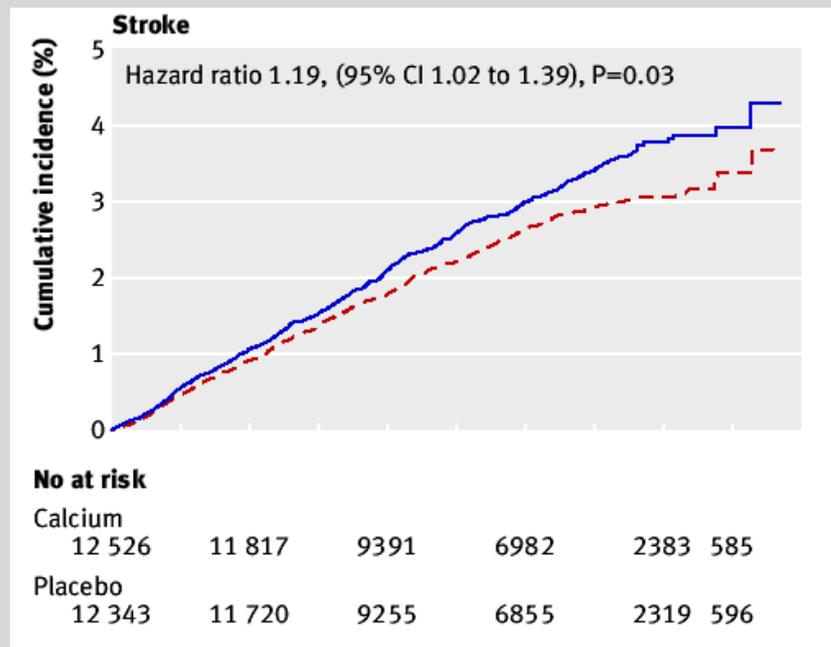
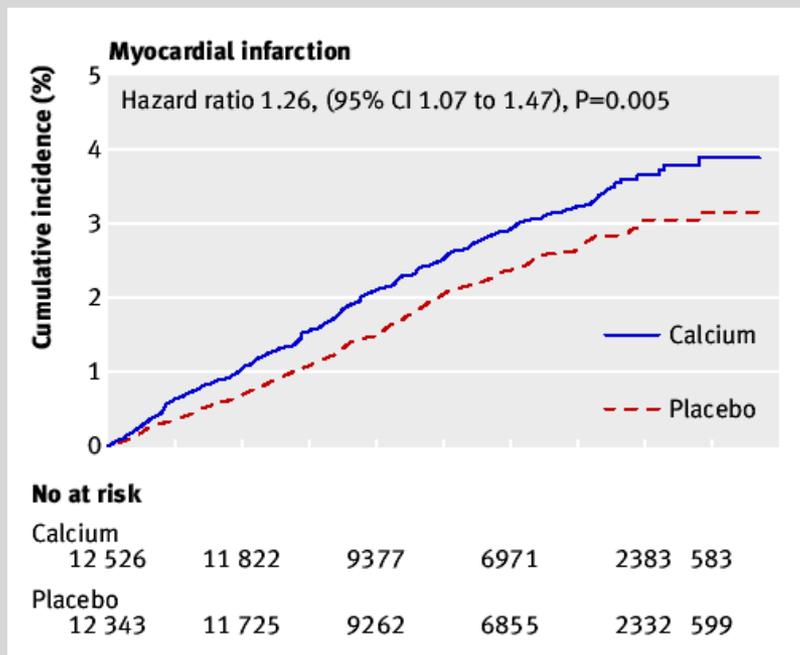
Vitamin D supplementation for prevention of mortality in adults

Fifty randomised trials with 94,148 participants provided data for the mortality analyses.

Overall, vitamin D decreased mortality (RR 0.97, 95% confidence interval (CI) 0.94 to 1.00).

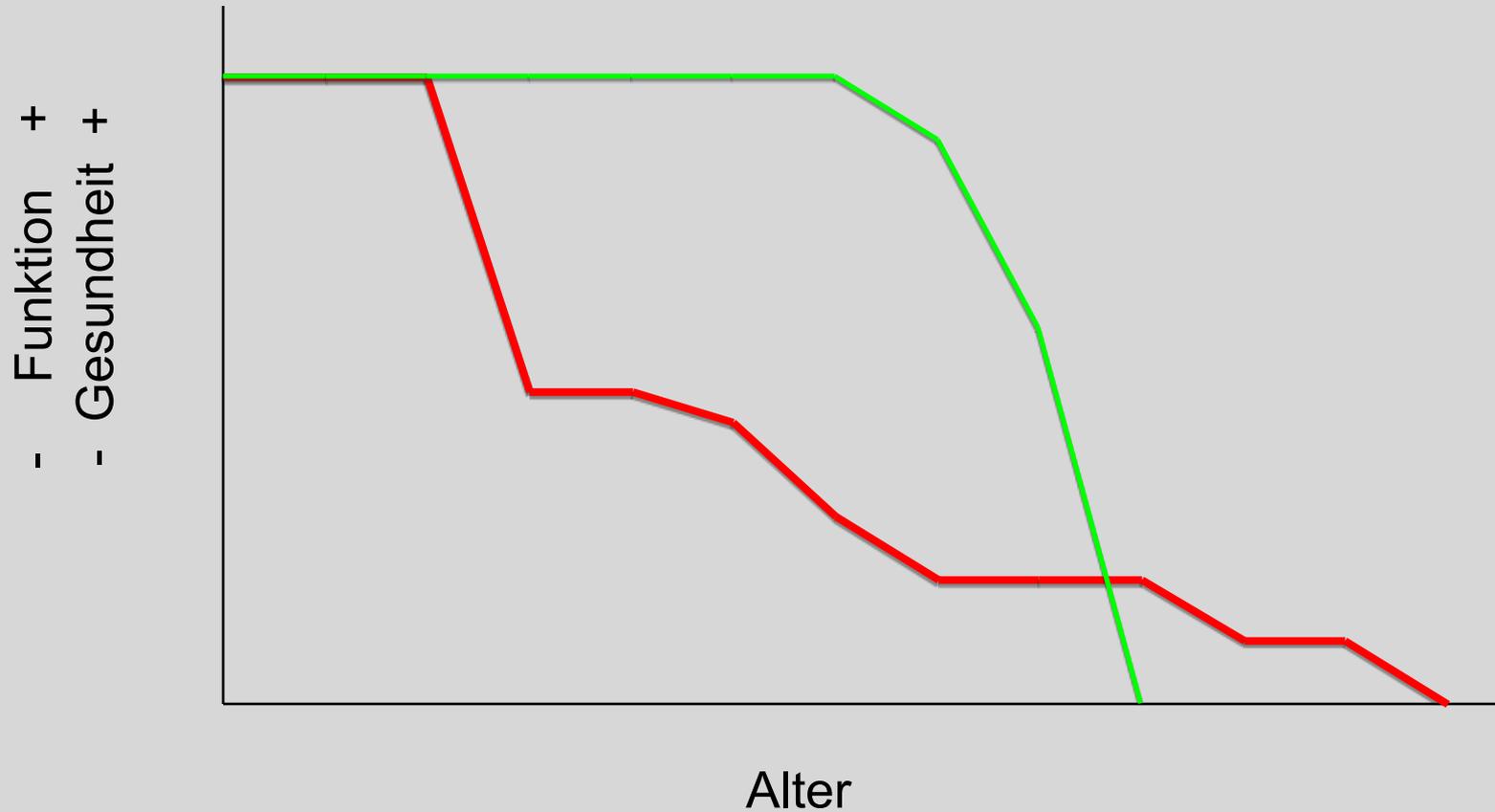
When the different forms of vitamin D were assessed separately, only vitamin D(3) decreased mortality significantly (RR 0.94, 95% CI 0.91 to 0.98; 74,789 participants, 32 trials) whereas vitamin D(2), alfacalcidol, or calcitriol did not.

Calcium supplements with or without vitamin D and risk of cardiovascular events: reanalysis of the Women's Health Initiative limited access dataset and meta-analysis



- Mikronährstoffe
 - **Hinsichtlich harter, krankheitsspezifischer Endpunkte
Endpunkte existieren kaum valide Daten**
 - **Wahrscheinlich können auch Mikronährstoffe über die
Ernährungsqualität erfasst werden**
 - **Für einige wenige Nahrungssupplemente existieren valide
Meta-Analysen**

Altern: Spanne und Funktion



Determinanten von Gesundheit und Lebenserwartung - 1

Smoking, body-mass index, and exercise patterns in midlife and late adulthood are predictors of subsequent disability. Not only do persons with better health habits survive longer, but in such persons, disability is postponed and compressed into fewer years at the end of life.

Determinanten von Gesundheit und Lebenserwartung - 2

- Gene
- Umwelt
 - Wohlstand
 - Bildung
 - Psychosoziales Wohlbefinden
 - Normales Körpergewicht
 - körperliche Aktivität

A wooden platter filled with a variety of food items. In the center are several ribs with yellow and red peppers. To the left are pickles and a small bowl of dressing. To the right are tomatoes, cucumbers, and a stack of bread. The platter is set on a wooden table with a knife and fork nearby.

**Herzlichen Dank
Für Ihre
Aufmerksamkeit**