

# Comparison of the effects of a low carbohydrate diet versus a diet upon the recommendations of the clinical practice guideline (high-carb, low-fat) in the treatment of type 2 diabetes

<b>Submission date</b> 12/09/2011	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered
<b>Registration date</b> 19/09/2011	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 07/01/2014	<b>Condition category</b> Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Recent research has raised questions about the appropriate diet-related treatment (dietetic treatment) of type 2 diabetes, where controlling blood sugar levels (glycemic control) is a vital part of therapy. The current dietetic strategy, established in clinical practice guidelines, recommends a diet high in carbohydrates and low in fat and protein. In contrast, a nutrition low in carbohydrates with higher amounts of fat and protein has also been associated with better glycemic control in diabetics. This study aims to compare the glycemic effects of both diets and hence supports the evaluation of dietetic treatment options for diabetes.

### Who can participate?

Inpatients of the rehab clinic in North Rhine-Westphalia, Germany, who have type 2 diabetes, and are aged 18 years or above.

### What does the study involve?

Participants will be randomly allocated to consume either a diet high in carbohydrates and low in fat and protein, or a diet low in carbohydrates with higher amounts of fat and protein. During the three-week inpatient rehabilitation, participants will receive all meals of the day according to their assigned diet plan. After completion of the rehabilitation participants should continue with their diet plan for another 21 weeks. Participants are then invited to the rehab clinic for a final examination. Participants will receive physical check-ups and complete questionnaires at the beginning and the end of the rehabilitation and 24 weeks after the start of the study.

### What are the possible benefits and risks of participating?

Participants may see an improvement in their health and physical function. There are no known risks associated with taking part in this study.

Where is the study run from?  
University of Witten/Herdecke, Germany.

When is the study starting and how long is it expected to run for?  
Enrolment of participants began in March 2011 and ended in October 2013. Follow-up examinations will continue until May 2014.

Who is funding the study?  
Association for the Advancement of Rehabilitation Research, Norderney, Germany.

Who is the main contact?  
Jan Karoff  
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## Contact information

**Type(s)**  
Scientific

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## Additional identifiers

**Protocol serial number**  
N/A

## Study information

**Scientific Title**  
Low carbohydrate nutrition in the treatment of type 2 diabetes: A randomized controlled trial on the glycemic effects of a low carbohydrate diet in comparison to a diet upon the recommendations of the clinical practice guideline (high-carb, low-fat)

**Acronym**  
DIKE

**Study objectives**  
DIKE (Diabetes-Intervention mit kohlenhydratreduzierter Ernährung). A diet low in carbohydrates - in comparison to a (high-carb, low-fat) diet according to the clinical practice

guideline - leads to improved diabetes control i.e. more favorable blood glucose values, namely HbA1c and fasting blood glucose.

On 03/01/2014 the anticipated end date was changed from 31/12/2013 to 30/06/2014.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Ethics committee of the University Witten/Herdecke (Ethik-Kommission der Universität Witten /Herdecke e. V.), 25/01/2011, ref: 98/2010

### **Study design**

Single-centre randomized controlled trial

### **Primary study design**

Interventional

### **Study type(s)**

Treatment

### **Health condition(s) or problem(s) studied**

Type 2 diabetes

### **Interventions**

1. Written consent of patient is required for participation in the trial. The potential study population recruits itself from the group of newly arrived inpatients of a German rehab hospital (indications: cardiology, orthopedic).
2. Baseline: data allocation for measurement time point 1 (t1).
3. Randomization to the two study arms followed by dietetic intervention: Whilst their three-week inpatient-rehabilitation, the study participants receive all meals of the day according to their assigned diet-plan. Nutrition in test group / control group: 25/55% carbohydrates, 30/15% protein, 45/30% fat.
4. During their rehabilitation, study participants experience theoretical lessons and a practical training in nutrition according to their diet-plan.
5. Week 3: Data allocation for measurement time point 2 (t2).
6. After completion of the rehabilitation, study participants are intended to stick to their diet-plan for another 21 weeks.
7. Three-day dietary records are administered in week 16 of the trial. Individual feedback by a nutritionist is provided to the participants.
8. After 24 weeks participants are invited to the rehab hospital for the trials final examination.
9. Week 24: Data allocation for measurement time point 3 (t3).

### **Intervention Type**

Other

### **Phase**

Not Specified

### **Primary outcome(s)**

## 1. Blood glucose parameters:

### 1.1. HbA1c

### 1.2. Fasting blood glucose

Measured at t1: baseline, t2: after 3 weeks, t3: after 24 weeks

## Key secondary outcome(s))

Surrogate markers:

1. Insulin level
2. Homeostasis Model of Assessment - Insulin Resistance (HOMA-IR)
3. Creatinine
4. Glomerular filtration rate
5. Body weight
6. Body-mass-index
7. Waist circumference
8. Serum lipid levels [total-, high density lipoprotein (HDL)-, low density lipoprotein (LDL)-cholesterol, triglyceride]

Survey data:

1. Diabetes-medication (type and dose rate)
2. Diabetes treatment satisfaction (DTSQs/DTSQc)
3. Satisfaction with the diet (self constructed)
4. Quality of life (WHO-5)
5. Physical activity\* (inpatient rehab data [t2], Freiburger Fragebogen zur körperlichen Aktivität [t3])

\*Note: No measurement at time point 1 [t1] due to reduction of activities in rehab-inpatients affected by cardiac or orthopedic events.

## Completion date

30/06/2014

# Eligibility

## Key inclusion criteria

1. Newly arrived inpatient of a selected rehab clinic (indications: cardiology, orthopedic) in North Rhine-Westphalia, Germany
2. Pre-diagnosed type 2 diabetes
3. Age of 18 years and above, either sex
4. Written consent

## Participant type(s)

Patient

## Healthy volunteers allowed

No

## Age group

Adult

## Lower age limit

18 years

**Sex**

All

**Key exclusion criteria**

1. No type 2 diabetes
2. Renal insufficiency (creatinine of 2.5 mg/dl and above)
3. Pregnancy
4. Consuming disease
5. Rudimental / poor literacy (German)

**Date of first enrolment**

22/03/2011

**Date of final enrolment**

30/06/2014

## **Locations**

**Countries of recruitment**

Germany

**Study participating centre**

Universität Witten/Herdecke

Ennepetal

Germany

58256

## **Sponsor information**

**Organisation**

Association for the Advancement of Rehabilitation Research, Norderney (Germany)

## **Funder(s)**

**Funder type**

Government

**Funder Name**

Association for the Advancement of Rehabilitation Research, Norderney (Verein zur Förderung der Rehabilitationsforschung e.V. Norderney) (Germany)

# Results and Publications

## Individual participant data (IPD) sharing plan

### IPD sharing plan summary

Not provided at time of registration

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes