# Functional MRI during cognitive processing of food stimuli in chronically ill and recovered women with anorexia nervosa

Published: 01-09-2009 Last updated: 10-08-2024

To determine 1) the differences in the effects of food stimuli on the activation of brain regions associated with energy homeostasis and reward between women with chronic AN, women recovered from AN and healthy normal-weight women, 2) the...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Appetite and general nutritional disorders
Study type	Interventional

# Summary

### ID

NL-OMON33446

**Source** ToetsingOnline

**Brief title** fMRI during cognitive processing of food stimuli

# Condition

• Appetite and general nutritional disorders

**Synonym** Anorexia Nervosa, Anorexia.

**Research involving** Human

### **Sponsors and support**

#### Primary sponsor: Universitair Medisch Centrum Utrecht

1 - Functional MRI during cognitive processing of food stimuli in chronically ill an ... 4-05-2025

#### Source(s) of monetary or material Support: Ministerie van OC&W

### Intervention

Keyword: Anorexia Nervosa, Cognitive processing, Food stimuli, Functional MRI

### **Outcome measures**

#### **Primary outcome**

1) The brain activation associated with viewing food stimuli. 2) Serum

concentrations of leptin, ghrelin and PYY. 3) Measures of cognitive

functioning, in particular the Wisconsin Card Sorting Test (set shifting

ability), and the Iowa Gambling Task (decision making performance).

### Secondary outcome

1) Subjective ratings of the desire to eat, 2) Subjective ratings of anxiety,

3) Energy intake (kJ) from the test meal.

# **Study description**

### **Background summary**

Anorexia Nervosa (AN) is a psychiatric disease which has a poor outcome due to lack of effective treatment. AN is characterized by obsessive fears and behavior with regard to food, weight and shape, which are all under strong cognitive control in patients. Although patients are constantly thinking of food, they refuse to eat. The central regulation of food intake behaviour is governed by different interacting brain systems. The homeostatic system regulates the balance between energy intake and energy expenditure and is affected by peripheral signals such as hormones. The hedonic system deals with the reward value of (food) stimuli and has neural circuits which encode wanting (incentive motivation) and liking (pleasantness). On top of these systems, the cognitive control system can strongly modulate the decision to eat or to refrain from eating. In contrast with the majority of people, patients with AN are able to starve themselves by restricting their food intake and ignoring the drive to eat.

The eating behavior of AN patients is usually studied by looking at 1 of these systems. Since such studies have not been able to find a good explanation for

the ambivalence towards food seen in AN patients, in this study we will examine the integration of these 3 systems.

### **Study objective**

To determine 1) the differences in the effects of food stimuli on the activation of brain regions associated with energy homeostasis and reward between women with chronic AN, women recovered from AN and healthy normal-weight women, 2) the correlation between hormone concentrations and these brain responses and 3) how variation in these brain responses correlates with measures of cognitive functioning.

### Study design

A cross-sectional experimental study. In the morning, subjects will undergo a 20 minute MRI scan. First, a perfusion MRI scan will be made. Second, a 15-min functional MRI scan will be made, during which subjects will be shown images of foods (varying in palatability) and of non-foods. During the functional scan, participants rate their level of anxiety and their liking for the foods they have been shown.

### Intervention

MRI during the presentation of food images.

### Study burden and risks

The experiment is non-therapeutic to the subjects and will consist of one study session. During screening, subjects will be asked to answer to guestionnaires on eating disorders, personality traits, depression and anxiety to rule out any inflicting psychiatric morbidity. On the study day, length, weight and % body fat will be measured by measuring height and weighing subjects on a TANITA (an impedance measurement device). Furthermore, a single fasting blood sample will be drawn to determine the concentrations of relevant hormones involved in food intake regulation. After blood sampling, the subjects will be scanned once with the use of an MRI scanner for 20 min, during which they will rate their anxiety and desire to eat. The same functional MRI paradigm has been used with AN patients in the Institute of Psychiatry in London and it poses no risk. Functional MRI is a safe and non-invasive technique. The tasks used for assessing cognitive functioning have been extensively used in AN patients and are not considered to be a burden; they are even perceived as amusing to perform. In summary, the risk associated with participation is assessed as negligible and the burden as minimal.

# Contacts

**Public** Universitair Medisch Centrum Utrecht

Heidelberglaan 100 3584 CX Utrecht Nederland **Scientific** Universitair Medisch Centrum Utrecht

Heidelberglaan 100 3584 CX Utrecht Nederland

# **Trial sites**

### Listed location countries

Netherlands

# **Eligibility criteria**

#### Age

Adults (18-64 years) Elderly (65 years and older)

### **Inclusion criteria**

- Right-handed

- Chronically ill AN patients should have suffered from the illness for at least two years (as defined by the DSM IV criteria) and have a BMI below 17.5 kg/m2.

- The women recovered from AN should be weight-recovered for at least 1 year (BMI > 17.5 kg/m2) and have a regular menstrual cycle

- Healthy control women should have a normal BMI, i.e. between 18.5 and 25 kg/m2 and a regular menstrual cycle.

### **Exclusion criteria**

- Contra-indications to MRI scanning on the basis of the MRI screening form, including:

4 - Functional MRI during cognitive processing of food stimuli in chronically ill an ... 4-05-2025

Claustrophobia, pregnancy, metal objects in the body incompatible with MRI scanning.

- Having a history of or current excessive alcohol consumption (> 28 units per week)
- Having a drug dependency
- Smoking daily

- Having a history of medical or surgical events that may significantly affect the study outcome.

# Study design

### Design

Interventional
Other
Non-randomized controlled trial
Open (masking not used)
Active
Basic science

### Recruitment

...

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	02-11-2009
Enrollment:	45
Туре:	Actual

# **Ethics review**

Approved WMO	
Date:	01-09-2009
Application type:	First submission
Review commission:	METC NedMec

# **Study registrations**

## Followed up by the following (possibly more current) registration

No registrations found.

### Other (possibly less up-to-date) registrations in this register

No registrations found.

### In other registers

Register CCMO ID NL28258.041.09