

# The effect of timing of lifestyle factors in addition to a regular lifestyle intervention

<b>Submission date</b> 06/11/2023	<b>Recruitment status</b> No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
<b>Registration date</b> 07/12/2023	<b>Overall study status</b> Ongoing	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 07/07/2025	<b>Condition category</b> Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

A combination of physical activity and a healthy diet, with added education and behavioural change techniques, has been shown to be effective in treating people with obesity, preventing type 2 diabetes, decreasing BMI and glucose concentrations and improving quality of life. Therefore, different combined lifestyle interventions (CLIs) are introduced in the basic health insurance in The Netherlands. In addition, the timing of lifestyle factors has been of increasing interest. For example, exercising in the afternoon or evening seems to be better for improving glucose compared to the morning, social jetlag (the result of the difference between an individual's circadian rhythms and imposed social schedules) is negatively associated with metabolic health and night-time snacking should be avoided. Therefore, it is expected that adding advice about the timing of these behavioural factors may be an essential addition to the currently available CLIs. However, this has not been tested before. Therefore, this three-armed intervention study will investigate the effect of intervening on the timing of a combination of lifestyle factors in addition to an existing online CLI on BMI and fasting glucose in adults with a CLI indication, compared to only the CLI or an observational arm of regular care by the general practitioner. This study will use the MiGuide-Cool online CLI. A secondary aim will also look into the effects of health-related quality of life, HbA1c (average blood sugar levels) and waist circumference.

### Who can participate?

Participants are adults aged over 18 years old who have a CLI indication as described in the MiGuide-Cool CLI for regular care of either obesity or overweight with at least one comorbidity of sleep apnea, vascular diseases, type 2 diabetes, arthrosis, and increased waist circumference (men >102cm; women >88cm).

### What does the study involve?

The study involves a two-year online MiGuide-Cool CLI, which is a program that includes both individual and group sessions. Furthermore, participants can use the MiGuide app to help adhere to the intervention. Part of the participants will be randomly assigned to the Timed CLI, in which they get the same MiGuide-Cool CLI but with added advice about the timing of healthy lifestyle behaviours, namely exercise, meal intake and sleep. During the intervention, all participants will be asked to fill in some questionnaires and perform a finger prick at home at baseline and after

three and nine months, which will take approximately 30 minutes extra per time point. These results will be compared with an observational arm, which will be extracted from the general care database.

What are the possible benefits and risks of participating?

The study participants are already planning on doing the CLI, therefore the CLI itself is not an additional benefit or risk. The questionnaires and at-home finger prick specific to the research will take 30 minutes extra per time point at three timepoints. Furthermore, at baseline and nine months, the MiGuide-Cool evaluation is already standard in the CLI. An extra evaluation (20 min) is added at three months which is specifically for the trial.

Where is the study run from?

Amsterdam UMC, although participants will be recruited via 'Huisartsenorganisatie West-Friesland', and 'Diabetes Care System' in Hoorn, 'Extramural LUMC Academic Network' in Leiden and via the MiGuide-Cool website.

When is the study starting and how long is it expected to run for?

April 2023 to January 2026

Who is funding the study?

1. The Netherlands Organization for Health Research and Development (ZonMw) [459001021]
2. Dutch Diabetes Research Foundation (Diabetes Fonds) [2019.11.101]
3. The Canadian Institutes of Health Research (CIHR) [TNC-174963]
4. Health-Holland [LSHM20107].

This collaborative project is co-financed with a PPP allowance made available by Health-Holland, Topsector Life Sciences & Health, to stimulate public-private partnerships.

Who is the main contact?

Dr Femke Rutters, f.rutters@amsterdamumc.nl

## Contact information

### Type(s)

Public, Scientific, Principal Investigator

### Contact name

Dr Femke Rutters

### ORCID ID

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### Contact details

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## Additional identifiers

**EudraCT/CTIS number**

Nil known

**IRAS number****ClinicalTrials.gov number**

Nil known

**Secondary identifying numbers**

Nil known

## **Study information**

**Scientific Title**

The effect of timing of lifestyle factors in addition to a regular care combined lifestyle intervention (CLI) on health outcomes in adults with a CLI indication

**Acronym**

TIMED

**Study objectives**

Adding advice about the timing of lifestyle factors, will improve BMI and fasting glucose to a greater extent than the regular combined lifestyle intervention alone.

**Ethics approval required**

Ethics approval required

**Ethics approval(s)**

Approved 09/01/2024, non-WMO Committee of the Medical Ethics Review Committee of Amsterdam University Medical Centers (Medische Faculteit, A325, Amsterdam, 1081BT, Netherlands; +31 (0)20-4445585; metc@amsterdamumc.nl), ref: 2023.0836

**Study design**

Three-armed pragmatic intervention randomized study with a regular combined lifestyle intervention of 2 years

**Primary study design**

Interventional

**Secondary study design**

Randomised controlled trial

**Study setting(s)**

GP practice, Internet/virtual, Medical and other records

**Study type(s)**

Prevention, Treatment

**Participant information sheet**

No participant information sheet available

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

Either 1) obesity (BMI >30 kg/m<sup>2</sup>); or 2) overweight (BMI >25 and <30 kg/m<sup>2</sup>) with at least one comorbidity of sleep apnea, vascular diseases, type 2 diabetes, arthrosis, or increased waist circumference (men >102cm; women >88 cm)

## **Interventions**

Current interventions as of 27/01/2025:

Participants will be randomly assigned in a 1:1 ratio to one of the two intervention arms using a variable block randomization algorithm (blocks of 2, 4 or 6) in Castor EDC. The intervention is performed in small groups with one lifestyle coach. To prevent knowledge spill-over, i.e. to prevent coaches of the timed group from using their knowledge in the original CLI group, coaches will either facilitate all original groups or all timed groups.

### **Study arm 1: CLI**

Combined Lifestyle Intervention named MiGuide-Cool, which is an online program of 2 years including individual and group sessions.

Participants will receive the existing Combined Lifestyle Intervention Cool-MiGuide, which is an online program of 2 years, with 4 individual sessions and 8 group sessions in the basic program (6-8 months) and 4 individual sessions (60 min.) and 8 group sessions (90 min.) in the maintenance phase (16-18 months). All sessions are online and group sessions take place in a group of 8-15 participants. A registered lifestyle coach will lead the group sessions as well as the individual sessions. Participants can use the MiGuide app, which is an online platform originally developed for patients with T2D and their healthcare providers. The connection with Cool makes the app relevant to a broader audience and helps participants of Cool-MiGuide adhere to the intervention. The app can be tailored to the goals and needs of the participant. Furthermore, the app can be connected to the participant's medical records. At baseline, after three and nine months, participants receive online questionnaires from the MiGuide as well as from the research centre. At 24 months the participants only receive questionnaires from MiGuide.

### **Study arm 2: Timed CLI**

Same Combined Lifestyle intervention as study arm 1, but with added advice on the timing of lifestyle factors, specifically on the timing of exercise, meal intake and sleep.

### **Observational arm: general care database**

Participants will be extracted from the general care database.

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### **Previous interventions:**

Participants will be randomly assigned in a 1:1 ratio to one of the two intervention arms using a variable block randomization algorithm (blocks of 2, 4 or 6) in Castor EDC. The intervention is performed in small groups with one lifestyle coach. To prevent knowledge spill-over, i.e. to prevent coaches of the timed group from using their knowledge in the original CLI group, coaches will either facilitate all original groups or all timed groups.

### **Study arm 1: CLI**

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#### **Study arm 2: Timed CLI**

Same Combined Lifestyle intervention as study arm 1, but with added advice on the timing of lifestyle factors, specifically on the timing of exercise, meal intake and sleep.

Observational arm: general care database

Participants will be extracted from the general care database STIZON.

### **Intervention Type**

Behavioural

### **Primary outcome measure**

The following primary outcome measures are assessed at baseline and after 3 and 9 months:

1. Fasting glucose measured at home using the Contour Plus Blue glucose monitor; 1 drop of blood is deposited from a finger prick on the stick, which is then inserted in the device and a photo will be taken of the measurement. The photo is then sent by email or phone to the researcher.
2. BMI calculated using the self-reported height and weight measured with standard methods

### **Secondary outcome measures**

1. Health-Related Quality of Life measured using the Dutch PROMIS scale V1.2 - Global Health
2. HbA1c measured using the Contour Plus Blue glucose monitor and HPLC assay
3. Waist circumference self-reported

### **Overall study start date**

01/04/2023

### **Completion date**

01/01/2026

## **Eligibility**

### **Key inclusion criteria**

1. Have a CLI indication as described in the MiGuide-Cool CLI for regular care. These inclusion criteria are either obesity (BMI >30 kg/m<sup>2</sup>) or overweight (BMI >25 and <30 kg/m<sup>2</sup>) with at least one comorbidity:
  - 1.1. Sleep apnea
  - 1.2. Vascular diseases
  - 1.3. T2D
  - 1.4. Arthrosis

- 1.5. Increased waist circumference (men >102cm; women >88cm)
2. Aged 18 years or older
3. Motivated to change lifestyle behaviour
4. Digitally skilled and in the possession of a smartphone
5. Being able to speak and understand the Dutch language

**Participant type(s)**

Other

**Age group**

Mixed

**Lower age limit**

18 Years

**Upper age limit**

100 Years

**Sex**

Both

**Target number of participants**

100

**Total final enrolment**

105

**Key exclusion criteria**

1. Unable to give written informed consent
2. Serious mental impairment i.e. preventing understanding of the study protocol/aim
3. Pregnant women
4. Working in night shifts or irregular phase shifts
5. Taken sulphonylurea (SU)

**Date of first enrolment**

01/07/2024

**Date of final enrolment**

01/07/2025

**Locations****Countries of recruitment**

Netherlands

**Study participating centre**

Amsterdam UMC

Meibergdreef 9

Amsterdam

Netherlands  
1105AZ

## Sponsor information

### Organisation

Amsterdam UMC Location VUmc

### Sponsor details

Meibergdreef 9

Amsterdam

Netherlands

1105AZ

None provided

[h.berkhof@amsterdamumc.nl](mailto:h.berkhof@amsterdamumc.nl)

### Sponsor type

Hospital/treatment centre

### Website

<http://www.vumc.nl/>

### ROR

<https://ror.org/00q6h8f30>

## Funder(s)

### Funder type

Research organisation

### Funder Name

ZonMw

### Alternative Name(s)

Netherlands Organisation for Health Research and Development

### Funding Body Type

Private sector organisation

### Funding Body Subtype

Other non-profit organizations

### Location

Netherlands

**Funder Name**  
Diabetes Fonds

**Funder Name**  
Canadian Institutes of Health Research

**Funder Name**  
Health Holland

## **Results and Publications**

**Publication and dissemination plan**  
Planned publication in a high-impact peer-reviewed journal

**Intention to publish date**  
01/12/2026

**Individual participant data (IPD) sharing plan**  
The dataset generated during and/or analysed during the current study will be available upon request from the Hoorn Steering Committee (hoornstudy@amsterdamumc.nl). All participants provided consent. Data can only be shared within the consent restrictions. Only pseudo-anonymized data can be shared when the application is approved.

**IPD sharing plan summary**  
Available on request