

# Sleep position device versus continuous positive airway pressure in central sleep apnea

<b>Submission date</b>	<b>Recruitment status</b>	<input type="checkbox"/> Prospectively registered
06/11/2023	No longer recruiting	<input type="checkbox"/> Protocol
<b>Registration date</b>	<b>Overall study status</b>	<input type="checkbox"/> Statistical analysis plan
11/12/2023	Ongoing	<input type="checkbox"/> Results
<b>Last Edited</b>	<b>Condition category</b>	<input type="checkbox"/> Individual participant data
05/12/2023	Nervous System Diseases	<input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Obstructive sleep apnea syndrome is caused by upper airway obstruction during sleep due to muscle relaxation. Central sleep apnea syndrome is caused by a lack of respiratory effort during sleep. In positional sleep apnea syndrome, apneas are relieved by sleeping in a non-supine position. A sleep position trainer is an effective treatment for positional obstructive sleep apnea syndrome. However, it has not been tested in positional central sleep apnea syndrome. This study aims to test the efficacy of a sleep positional trainer in positional central sleep apnea syndrome.

### Who can participate?

Adult patients with mild to moderate positional central sleep apnea syndrome

### What does the study involve?

Participants will be allocated to treatment with either a sleep position device (Nightbalance, Philips, The Netherlands) or continuous positive airway pressure (CPAP).

A sleep position device can be used to treat patients with mild to moderate obstructive sleep apnea syndrome. Sleep apnea is often not present in such patients in the side position and the device trains patients to sleep more in the side position. The effect of a sleep position device has been well-studied in obstructive sleep apnea syndrome. The effect on central sleep apnea syndrome is not known.

A sleeping position device is a small, flat, lightweight device. This is worn at the front in a soft band around the chest. Through light vibrations, the device reminds the patient not to sleep on their back but on their side. These light vibrations do not disturb sleep quality. The strength of the vibrations is adjusted to the individual patient by smart algorithms. The result is that this treatment is usually well tolerated in the long term.

CPAP is currently the standard treatment for central sleep apnea patients. CPAP is a small box with a motorized fan inside. This fan draws air from the room. The air pressure is then slowly increased by the device. The air is then delivered at an air pressure adjusted specifically to the patient's needs. There is a filter on the device that filters out dust, smoke and other impurities in

the air. Built into the CPAP machine is a humidifier. The CPAP device has an air hose that connects the device to the CPAP mask. The CPAP device and mask are adjusted to the patient's needs during a CPAP adjustment period through the Martini Hospital Sleep Center.

What are the possible benefits and risks of participating?

It is important that participants carefully weigh the possible pros and cons before deciding to take part. A possible advantage of participating in this study is that treatment with a sleep position trainer is better tolerated than standard treatment with CPAP.

A risk may be that treatment with a sleep position trainer will prove less effective than treatment with a CPAP. In that case, participants will be treated suboptimally for a period during the research period and complaints of sleep apnea syndrome may persist for longer. Another disadvantage of participating in the study is that they will have polysomnography done twice where this is otherwise not always necessary.

The sleep position trainer or CPAP device can cause side effects.

These adverse effects are common (affecting 1 in 10 people or more) with a sleep position trainer:

1. The sleep apnea syndrome may not be sufficiently corrected and fatigue may then remain present to some extent
2. Only 71% of patients manage to use the sleep position trainer regularly

These adverse effects are common (affecting 1 in 10 people or more) with CPAP:

1. Stuffy nose
2. Running nose
3. Dry mouth
4. CPAP mask pressure on the face
5. CPAP mask leakage
6. Bothered by noise from the CPAP box

These adverse effects occur with CPAP, but not as often:

1. Irritated eyes
2. Suffer from cold air
3. Difficulty breathing out
4. Bronchitis complaints
5. Anxiety complaints

The sleeping position trainer may also have adverse effects that are still unknown. The effects of the sleep position trainer have not yet been sufficiently investigated in position-dependent central sleep apnea syndrome. The efficacy may be less than the efficacy of CPAP in this condition.

Where is the study run from?

This study is performed by the pulmonologists and ENT doctors of the Sleep Center of the Martini Hospital, Groningen, The Netherlands.

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

June 2019 to January 2027

**Who is funding the study?**

This study is funded by the Research Department of the Department of Pulmonary Medicine, Martini Hospital Groningen, The Netherlands

**Who is the main contact?**

Dr. W. Jacobs, MD, PhD, w.jacobs@mzh.nl

## Contact information

### Type(s)

Public, Scientific, Principal investigator

### Contact name

Dr Wouter Jacobs

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## Additional identifiers

### Clinical Trials Information System (CTIS)

Nil known

### ClinicalTrials.gov (NCT)

Nil known

### Protocol serial number

Nil known

## Study information

### Scientific Title

Sleep position device versus continuous positive airway pressure in mild to moderate central sleep apnea: a randomized trial

### Acronym

SPCSA

### Study objectives

A sleep position trainer is an effective treatment for positional central sleep apnea syndrome equivalent to continuous positive airway pressure (CPAP)

### Ethics approval required

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**Ethics approval(s)**

approved 24/02/2020, Regionale Toetsingscommissie Patientgebonden Onderzoek (RTPO MCL. 3 e etage Dunantflat, Postbus 888, Leeuwarden, 8901 BR, Netherlands; +31 058 2861151; RTPO@zbn.nl), ref: NL70711.099.19

**Study design**

Single-centre randomized prospective trial

**Primary study design**

Interventional

**Study type(s)**

Treatment

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

Positional central sleep apnea syndrome

**Interventions**

This is a single-centre randomised prospective trial between CPAP and sleep position device treatment.

Written patient informed consent will be obtained. Diagnosis at baseline is by polysomnography. Randomisation will be stratified according to BMI and smoking. Physicians and patients are not blinded to the treatment arms. Eligible patients are randomized to either standard CPAP therapy or SPD treatment.

Epworth Sleepiness Scale (ESS) is measured at baseline and subsequently under treatment at 3 and 12 months. Polysomnography for AHI measurement is repeated under treatment at 3 and 12 months.

**Intervention Type**

Device

**Phase**

Phase III

**Drug/device/biological/vaccine name(s)**

Sleep Position Trainer (NightBalance, Philips, Netherlands)

**Primary outcome(s)**

The total apnea-hypopnea index (AHI) measured using polysomnography at baseline, 3 months and 12 months

**Key secondary outcome(s)**

1. Total central AI, total central AHI, AHI supine, AHI non-supine, supine central AHI, non-supine central AHI, total sleep time supine, total sleep time non-supine measured using polysomnography outcome parameters which are scored manually by scorers blinded to the treatment arm
2. Sleepiness measured using the Epworth Sleepiness Scale (ESS) at baseline and 3 and 12 months
3. Compliance measured using digital use readings from the Night-Balance sleep position device

and CPAP machine at 3 and 12 months follow-up

4. Other study parameters: General baseline measurements: age, sex, weight, height, BMI, active smoking yes/no

## Completion date

01/01/2027

# Eligibility

## Key inclusion criteria

In order to be eligible to participate in this study, a subject must meet all of the following criteria:

1. Patients with central positional sleep apnoea are included in the study.
2. Apnoehypopneuindex  $\geq 5$  AND  $\leq 30$ .
3. Patient age  $\geq 18$ .

Central sleep apnoea is defined as: AHI  $\geq 5$  with 50% or more of events occurring without any respiratory effort. And associated with symptoms of either excessive sleepiness or disrupted sleep.

Positional sleep apnoea is defined as having a supine AHI  $\geq 2 \times$  AHI non-supine with  $\geq 10\%$  and  $\leq 90\%$  supine sleep

## Participant type(s)

Patient

## Healthy volunteers allowed

No

## Age group

Mixed

## Lower age limit

18 years

## Upper age limit

80 years

## Sex

All

## Key exclusion criteria

A potential subject who meets any of the following criteria will be excluded from participation in this study:

1. Chronic respiratory insufficiency (paCO<sub>2</sub>  $> 6$  kPa)
2. BMI  $\geq 30$
3. Left-sided valvular heart disease  $>$  mild
4. Patients with symptomatic heart failure (AHA stadium C)
5. Night or rotating shift work
6. Active psychiatric disease

7. Seizure disorder
8. Medication use for sleeping disorders
9. Previous treatment with CPAP or sleep position device
10. Simultaneous other OSAS treatments
11. Pregnancy
12. Coexistent non-respiratory sleep disorders (e.g. insomnia, periodic limb movement disorder, narcolepsy) that would influence functional sleep assessment

**Date of first enrolment**

01/03/2020

**Date of final enrolment**

01/01/2026

## Locations

**Countries of recruitment**

Netherlands

**Study participating centre****Martini Hospital**

Wetenschapsbureau Martini Ziekenhuis  
Van Swietenplein 1  
Groningen  
Netherlands  
9728 NT

## Sponsor information

**Organisation**

Martini Ziekenhuis

**ROR**

<https://ror.org/017b69w10>

## Funder(s)

**Funder type**

Hospital/treatment centre

**Funder Name**

Martini Hospital

# Results and Publications

## Individual participant data (IPD) sharing plan

The datasets generated and/or analysed during the current study will be published as a supplement to the results publication

## IPD sharing plan summary

Published as a supplement to the results publication

## 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