

# Transdermal magnesium absorption as due to bathing in baths filled with magnesium chloride

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<b>Ethical review</b>	Not approved
<b>Status</b>	Will not start
<b>Health condition type</b>	Other condition
<b>Study type</b>	Interventional

## Summary

### ID

NL-OMON35577

### Source

ToetsingOnline

### Brief title

Transdermal magnesium absorbtion

### Condition

- Other condition

### Synonym

magnesium deficiency, magnesium shortage

### Health condition

magnesium opname, en mogelijk magnesium tekort

### Research involving

Human

## Sponsors and support

**Primary sponsor:** Universitair Medisch Centrum Groningen

**Source(s) of monetary or material Support:** unrestricted grant

## Intervention

**Keyword:** baths, magnesium, skin, uptake

## Outcome measures

### Primary outcome

The primary study parameter are the changes in magnesium concentration in the urine and changes in magnesium concentrations in the interstitium.

### Secondary outcome

n.a.

## Study description

### Background summary

Magnesium plays an important role in different kinds of reactions in the body. Magnesium deficiency is often seen in the Western population as due to the foodprocessing process. A magnesium deficiency is associated with chronic diseases such as atherosclerosis, hypertension, diabetes mellitus, tiredness, arrhythmias, stress, ADHD and cancer.

It is frequently claimed that the transdermal route, so absorption trough the skin, is a good way for magnesium supplementation. Products such as: magnesium oils, bath flakes containing Dead Sea minerals or pure magnesium are widely available and frequently used despite the lack of scientific evidence for transdermal magnesium uptake. In many Spa and wellness centers throughout the world magnesium sulfate ( $\text{MgSO}_4$ ) and magnesium chloride ( $\text{MgCl}_2$ ) are used for flotation therapy. Despite the transdermal application of magnesium there is no evidence for transdermal uptake of magnesium. So we aimed to investigate if there exist an uptake of magnesium across the skin.

### Study objective

We aimed to investigate if there exist transdermal magnesium absorption.

## Study design

In this study 2 groups will be compared in a randomized experimental design. As due to drawing lots a volunteer will be classified in the intervention group or in the control group. In the intervention group the absorption of magnesium across the skin will be measured as due to taking baths filled with magnesiumchloride. The control group will take baths filled with sodiumchloride. In bothgroups the uptake of magnesium across the skin, as due to bathing. The effects on the magnesiumconcentration of the healthy volunteers in the intervention group will be compared with the effects on the magnesiumconcentration of the healthy volunteers in the control group.

The intervention for the intervention group will consists of 3 baths with a duration of twenty minutes. The day before the test day the participants will collect 24 hour urine. To determine the magnesium concentration, blood and oral mucosa will be collected by arriving at swim paradise 'Tropiqua'. Also the blood pressure and pulse will be measured. After these tests the participants will take 3 baths with magnesium chloride, for a duration of twenty minutes. After every bath the healthy volunteers have to catch up the urine. The blood pressure and pulse will be measured as well. After the third bath, besides collecting urine and measuring of the blood pressure and pulse, also blood and oral mucosa will be collected.

The study design will be the same for the control group. However the baths will not contain magnesium chloride but sodium chloride. In the control group the same measurements will be performed as in the intervention group.

## Intervention

The intervention group will take 3 baths filled with magnesiumchloride. The baths have a duration of twenty minutes. The whirlpools will have a watertemperature of 37 degrees and a concentration of 22-26% magnesiumchloride. The whirlpools will be available in tropical swim paradise \*Tropiqua\* in Veendam.

The control group will take 3 baths of twenty minutes filled with a sodiumchloride solution. The whirlpools will have a watertemperature of 37 degrees and a concentration of 30-33% sodiumchloride. The whirlpools will be available in tropical swim paradise \*Tropiqua\* in Veendam.

## Study burden and risks

Bathing in magnesium chloride is comparable to taking a bath in the Dead Sea ( salinity 33%). The Dead Sea contains a high percentage of magnesiumchloride: 50.8%. As known from several studies bathing in the Dead Sea has a positive influence on the skin. In many Spa and wellness centers throughout the world

magnesium sulfate (MgSO<sub>4</sub>) and magnesium chloride (MgCl<sub>2</sub>) are used for flotation REST therapy. There are several studies on flotation REST as a therapy as such in which no side effects are reported. The baths are pH neutral. The baths can give a light sensation on the skin, but this is not harmful. Here fore, we consider the risks of the study to be small.

## Contacts

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## Trial sites

### Listed location countries

Netherlands

## Eligibility criteria

### Age

Adults (18-64 years)

Elderly (65 years and older)

### Inclusion criteria

Volunteers need to be between 18-70 years

Signed informed consent

## Exclusion criteria

Diabetes mellitus

Cardiovascular diseases

Age > 70 years

Hypertension (Systolic >140 mmHg, Diastolic >90mmHg)

Open wounds (such as \*wet\* eczema)

Incontinence

## Study design

### Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)
Control:	Active
Primary purpose:	Treatment

### Recruitment

NL	
Recruitment status:	Will not start
Enrollment:	12
Type:	Anticipated

## Ethics review

Not approved	
Date:	08-09-2011
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

## 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	ID
CCMO	NL37973.042.11