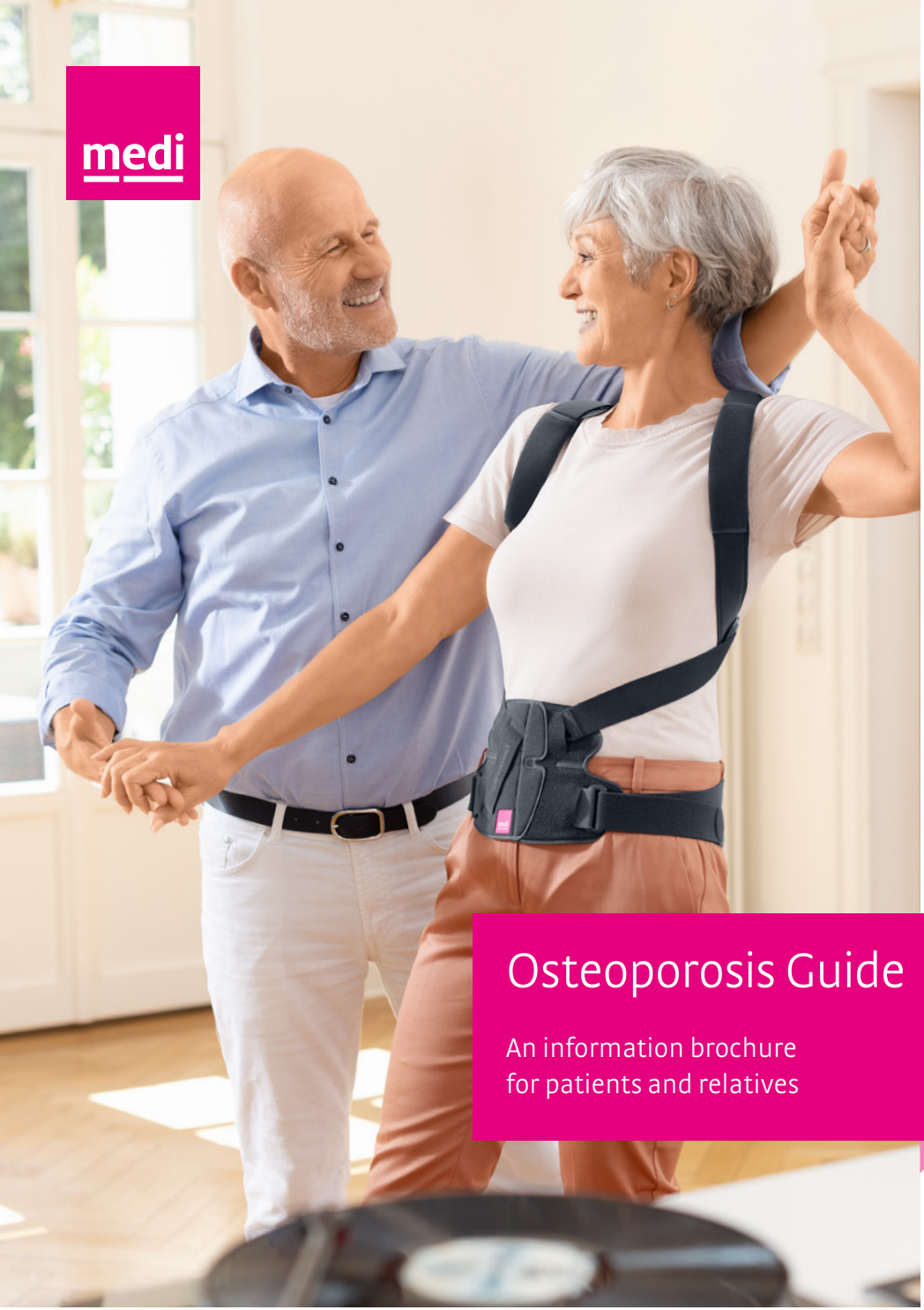

Osteoporosis Guide

An information brochure
for patients and relatives

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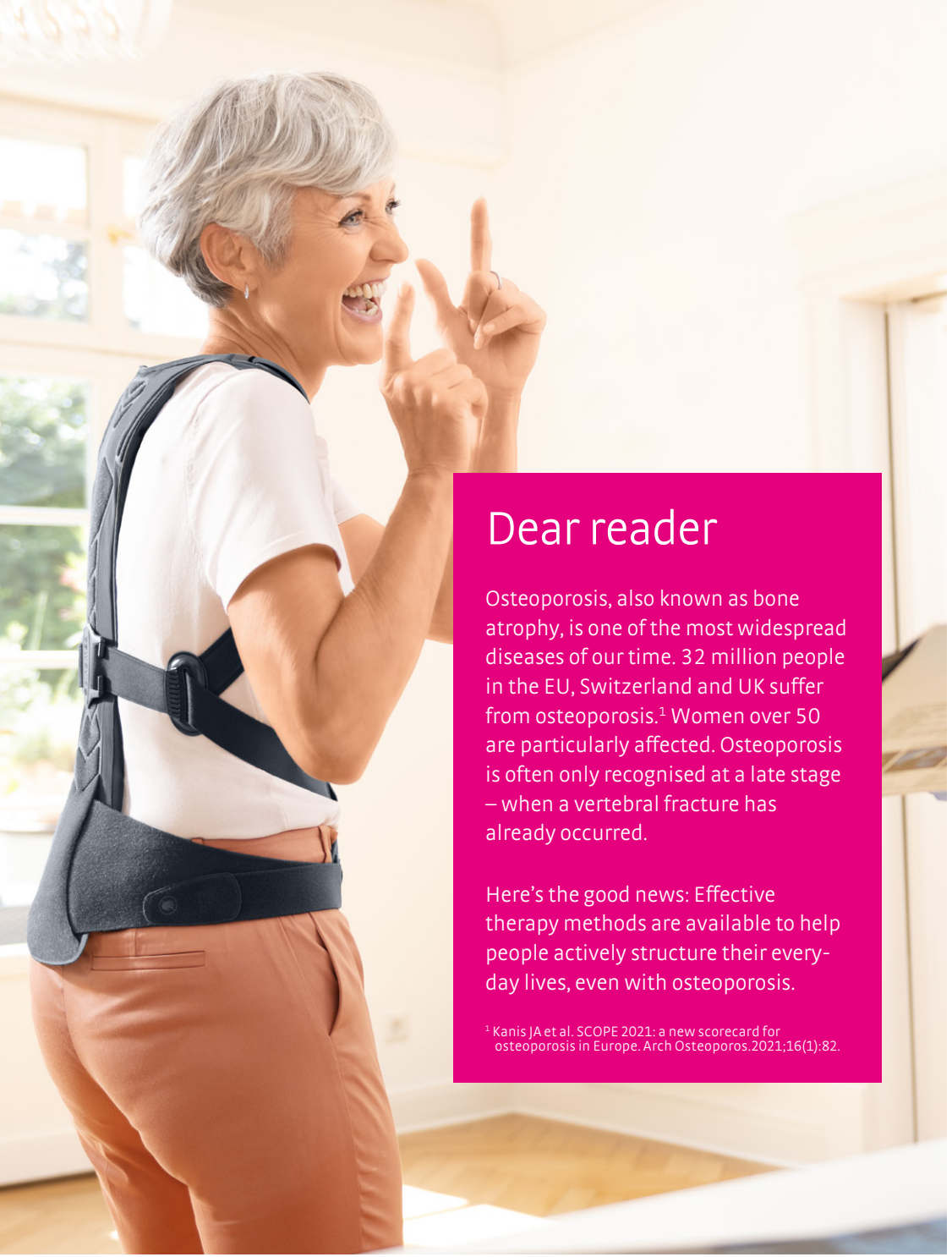


Dear reader

Osteoporosis, also known as bone atrophy, is one of the most widespread diseases of our time. 32 million people in the EU, Switzerland and UK suffer from osteoporosis.[1] Women over 50 are particularly affected. Osteoporosis is often only recognised at a late stage – when a vertebral fracture has already occurred.

Here's the good news: Effective therapy methods are available to help people actively structure their everyday lives, even with osteoporosis.

[1] Kanis JA et al. SCOPE 2021: a new scorecard for osteoporosis in Europe. Arch Osteoporos.2021;16(1):82.

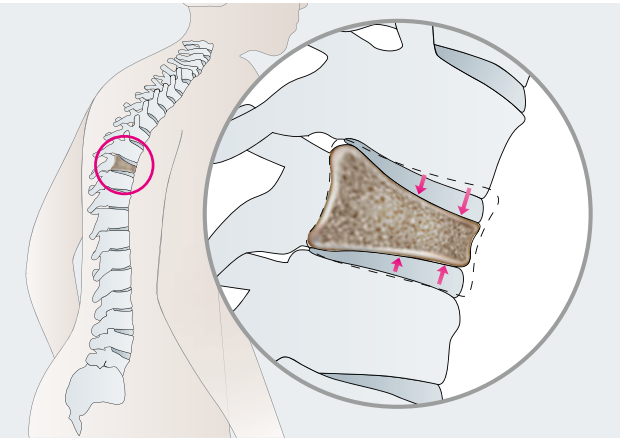
Osteoporosis

What is osteoporosis?

Bones are real architectural masterpieces. They consist of living tissue. As a result, our bones undergo continuous remodelling process over the course of our lives.

This balance shifts with increasing age. More bone mass is lost than formed, particularly in women over the age of 50. This is caused, among other things, by hormones. To a certain extent, this is part of the natural human ageing process.

If, however, too great an imbalance occurs between bone loss and formation and a great deal more bone mass is lost, medicine refers to this as the metabolic skeletal disease osteoporosis. The consequences can be seen, among other places, in the spine. Vertebral bodies that were originally healthy become brittle under the load of your own body weight and lose their shape. A particularly common form of vertebral fracture is, for instance, what is known as a wedge vertebra.



A healthy vertebral body becomes a wedge vertebra.

About 6.3 million Germans suffer from osteoporosis. Women over 50 are particularly affected.

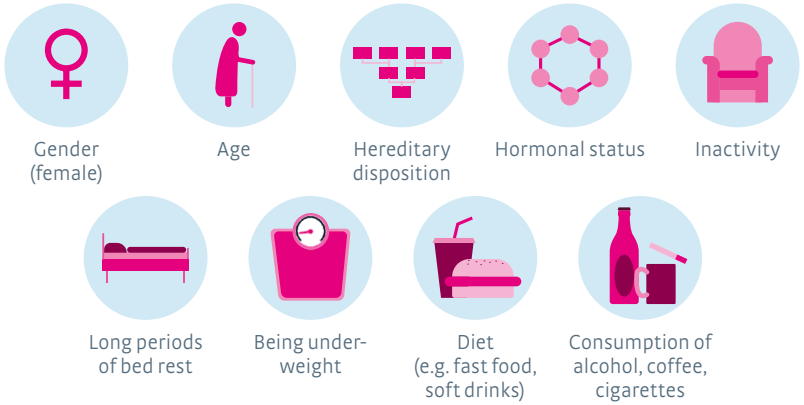
Around 885,000 people are diagnosed annually.[1]

Symptoms

Bones become weak as a result of osteoporosis. They become porous, which can lead to bone fractures – especially in the vertebra, femoral neck (thigh) and forearm . Fractures of the vertebral body can lead to incorrect posture and the back forming a “Dowager’s hump”. Other symptoms can be a decrease in height or severe, chronic pain around the spine.

Risk factors

Osteoporosis is divided into two different forms, primary and secondary osteoporosis. Primary osteoporosis comprises approximately 95 per cent of all bone atrophy illnesses. Risk factors for the development of **primary osteoporosis** are:



Secondary osteoporosis can occur as a result of certain pre-existing conditions or as a side effect of certain medication.

[1] Epidemiologie der Osteoporose: Bone Evaluation Study, Deutsches Ärzteblatt 2013;4:52ff.

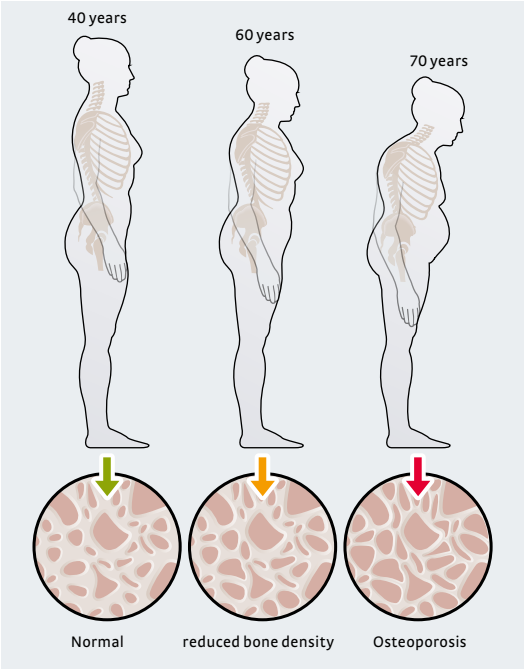
Brittle bones

What effect does osteoporosis have on the body?

Due to vertebral fractures, the spine loses height and collapses. The thoracic spine increasingly bends forwards. A visible indication of osteoporosis is thus a hunchback, also known as a dowager's hump. Patients lose height and their arms appear proportionally too long. Many osteoporosis patients have lasting back pain and are less mobile and less active which, in turn, causes the further loss of bone and muscle.

The risk of a vertebral fracture caused by osteoporosis increases with age. If a vertebral fracture has already occurred, the likelihood of further fractures can increase. Around half of all osteoporosis patients suffer from at least one further fracture within four years.[1]

[1] Hadji P et al. Epidemiologie der Osteoporose: Bone Evaluation Study. Eine Analyse von Krankenkassen-Routinedaten. Deutsches Ärzteblatt Int 2013;110(4):52–57.



A hunchback (dowager's hump) can be a visible indication of osteoporosis.

Effective osteoporosis therapy

How can osteoporosis be treated?

Effective therapy for osteoporosis is based on numerous pillars – which are individual for every patient.

Besides taking medications, diet and exercise, or physiotherapy, also play a major role. In addition, the Dachverband Osteologie (umbrella organisation for specialists working in the field of osteology), recommends the wearing of spinal straightening back orthoses in its guidelines.[1] They help to straighten the upper body and relieve pain following vertebral fractures.

Two spinal straightening back orthoses (Spinomed® and Spinomed® active) have been specially developed for use following vertebral fractures. They strengthen the muscles, straighten the upper body and have a fast, lasting effect.[2,3] The strengthening effect starts from day one.

Film tip

The video shows you the effect of spinal straightening back orthoses.
https://vimeo.com/595226441

You can find more information about biofeedback on our website:
medi.biz/biofeedback

Mehr Informationen
medi.biz/biofeedback

[1] DVO. Prophylaxe, Diagnostik und Therapie der Osteoporose bei postmenopausalen Frauen und bei Männern 2017;196–201. Published online at: http://dv-osteologie.org/uploads/Leitlinie%202017/Finale%20Version%20Leitlinie%20Osteoporose%202017_end.pdf (Last accessed 17.06.2021).

[2] Pfeifer M et al. Am J Phys Med Rehabil 2004;83(3):177–186.

[3] Pfeifer M et al. Am J Phys Med Rehabil 2011;90(10):805–815.

Strengthen muscles – improve posture

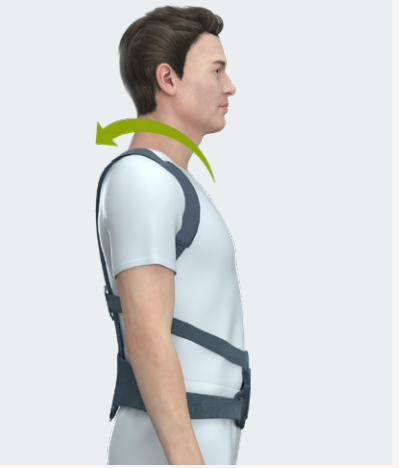
What effect do spinal straightening orthoses have?

Special spinal straightening orthoses (e.g. Spinomed® and Spinomed® active) function according to the **biofeedback** mode of action.

The flexible materials and harnesses of the Spinomed back orthoses, together with the back splint, exert noticeable pulling forces on the pelvic and shoulder area. Every time you slump into an incorrect posture, your orthosis reminds you to adopt an upright posture through gentle pressure.

The biofeedback principle reminds you of the correct posture.

The result: You tighten the core muscles by reflex, completely unconsciously. In this way, the upper body straightens back up again on its own. This process describes the biofeedback principle.



Your muscles are strengthened and the upper body straightened.

Spinal straightening orthoses from medi use gentle pressure to remind the wearer of correct posture when it is poor. The upper body straightens up again through its own **muscle strength**. A back orthosis encourages an upright posture and also works as a training device for the core muscles.

Tips for an active life with osteoporosis

How can I stop the condition from progressing?

Keep moving:

- Keep physically active and move as much as your health allows. These sports may be suitable for osteoporosis patients (consult your doctor if you are unsure):

- Go for lots of walks. Sun promotes the production of vitamin D, which is very important for bone formation.
- Incorporate more activity into your everyday life (climbing stairs, cover short distances on foot, etc.).

Pay attention to diet:

- Consume dairy products. They are important for supplying vitamin D and calcium.
- Eat calcium-rich fruit (e.g. blackberries or raspberries) and vegetables (e.g. fennel, broccoli or cabbage) regularly.
- Do not smoke.

Maintain a balance:

- Your weight should lie within the normal range. Avoid being either overweight or underweight.
- Stand, walk and sit as upright as possible, with raised head and straight shoulders. Stay relaxed and mobile.
- Sit with a straight spine, pull your shoulders back, vary your sitting position often.
- Remove any trip hazards in your home to reduce the risk of a fall.

Osteoporosis exercises

Exercises to strengthen the muscles and promote mobility

Take your time with the exercises, work slowly and with little force, take breaks if you need to. Talk to your doctor about which exercises are suitable for you. The exercises below are for osteoporosis patients (with an osteoporotic vertebral fracture).

1st exercise:
Straightening of the cervical spine

Aim: Postural training, stretching of the neck muscles

Starting position: Stand up straight behind a chair with your legs hip-width apart.

Exercise: Place two fingers on your chin, push your head towards your back with your chin until you can feel a stretch in your neck muscles.

Hold for 5 x 10 seconds

2nd exercise:
From sitting to standing

Aim: Strengthening of the "leg extenders"

Starting position: Sit up straight on a chair, legs hip-width apart.

Exercise: Pull your feet slightly behind the chair, lean your upper body forward slightly and stand up (you can use the chair for support), look forward, move backwards in small steps until your legs reach the edge of the chair, slowly lower your buttocks onto the chair (you can hold onto the chair).

10 repetitions

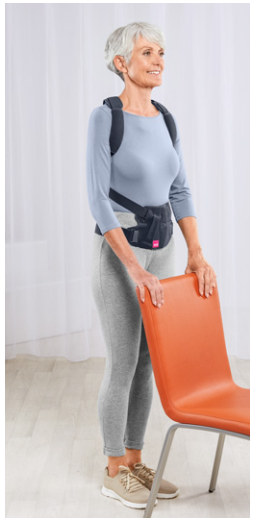
3rd exercise: Lifting leg to the side

Aim: Strengthening of the lateral hip muscles

Starting position: Stand behind a chair and hold onto the backrest.

Exercise: Lift your outstretched leg up to the side and carefully lower it again. Your upper body remains straight throughout this.

10 repetitions per leg



4th exercise: Rocking your feet

Aim: Strengthening of the calf muscles and dorsal flexors of the feet/stabilisation of the leg axis

Starting position: Stand behind a chair.

Exercise: Slowly lift your heel (do not overstretch knees), slowly lower your heel again, lift your toes, lower your toes again.

10 to 20 repetitions

5th exercise: Pulling to the side

Aim: Strengthening of the shoulder girdle and back muscles

Starting position: Stretch your arms out in front of you shoulder-width apart and hold onto a training band.

Exercise: Move your outstretched arms to the sides while putting tension on the band (keep hands at shoulder height where possible).

10 repetitions

6th exercise: Rowing while sitting on a chair

Aim: Strengthening of the shoulder girdle and back muscles

Starting position: Sit on a chair, place training band in the middle under the soles of your feet.

Exercise: Hold the ends of the training band with both hands and pull backward until your hands are at torso height (“rowing motion”).

10 to 20 repetitions

Nutritional tips for osteoporosis

The best for your bones

Diet has a significant influence on our bone stability. A wholesome, balanced, calcium-rich diet with fruit and vegetables forms the basis for a stable skeleton. Fruit and vegetables contain many nutrients, including vitamin K, C and B, potassium, and magnesium, which are also involved in the bone metabolism.

Daily calcium requirement 1,000 mg – calcium provides substance for bones

- Sufficient calcium intake is essential in the prevention and treatment of osteoporosis. This is because calcium is one of the main components of our bones: without calcium, bones cannot form.

Vegetables

- Broccoli, green cabbage, rocket, lamb's lettuce

Dairy products

- Hard cheese, yoghurt, milk, buttermilk

Nuts/seeds

- Sesame, almonds, hazelnuts, sunflower seeds, pumpkin seeds

Plant-based protein

- Pulses, tofu, lupin beans

Mineral water with at least 150 mg calcium per litre

Fish

- Coldwater fish such as herring, mackerel, salmon provide vitamin D

Vitamin D promotes the intake of calcium and the incorporation of minerals in the bones

Avoid ready meals with preservatives. And in addition:

- Cola, fizzy drinks, alcohol, processed cheese and cold meats, pork, salty foods
- Foods with lots of oxalic acid such as spinach, beetroot, rhubarb or chocolate can reduce the intake of calcium.

Suggested recipes for osteoporosis

Breakfast

Bircher muesli for 2 people

- 8 tbsp wholegrain oat flakes
- 1 grated apple
- 10 g almonds
- 1 tbsp each of linseeds, pumpkin seeds, sunflower seeds
- 20 g dried cranberries
- 2 prunes
- 2 – 3 tbsp natural yoghurt
- 1 tbsp linseed oil
- 1 tbsp honey
- Cinnamon, vanilla, fresh berries, apple, banana (depending on season and preference)
- 1 tbsp each wheat germs, rose hip powder, roasted tiger nut flakes, oat flakes

Place the first 6 ingredients into a bowl, mix, cover with water, leave to soak overnight.

On the next day, add natural yoghurt, linseed oil, spices and sweetness to taste, garnish with fresh berries/fruit depending on the season. Optionally add wheat germs, rose hip powder, roasted tiger nut flakes and oat flakes to spice things up.

Buckwheat fresh grain muesli

Variant: Leave buckwheat to germinate for two days, add fresh berries and spices on the next day and all of the other ingredients as desired

.

Suggested recipes for osteoporosis

Main courses

Fruity broccoli salad for 2 people

- 500 g broccoli
- 2 tbsp sesame seeds
- 1 spring onion
- 8 tbsp olive oil
- Juice of 1 lemon
- Herbal salt, pepper
- 1 tbsp mustard
- ½ onion

Finely purée the last 6 ingredients in a mixer for the dressing, brown the sesame seeds in a pan, divide the broccoli into florets and steam for around 3 minutes. Mix broccoli with the dressing, sprinkle with sesame seeds. Optionally serve with a salmon fillet that has been briefly seared. Those who like things a little fruitier can add a flat peach cut into small pieces or fresh berries.

Tip: Steam double the amount of broccoli so that you also make a soup for the next day:

Cream of broccoli soup

- 700 ml vegetable stock
- 800 g broccoli
- 4 potatoes
- Herbal salt
- 1 onion
- Salt, pepper, nutmeg
- Optional: fresh herbs, walnuts

Finely chop the onion, brown, dice the potatoes, add, pour in the vegetable stock, allow to simmer gently, add broccoli, season with salt, pepper and nutmeg and purée finely. Finely chop fresh herbs and 1 tbsp walnuts as the topping.

Courgette carpaccio for 2 people

- 3 small green courgettes
- 1 – 2 tbsp oil (olive)
- Salt, pepper
- 8 black olives
- 3 dried tomatoes
- 1 tsp lemon juice
- Basil
- 1 tbsp cedar nuts
- 1 buffalo mozzarella

Cut courgette lengthways into 0.5 cm thin slices, drizzle with oil (olive) and roast in the oven at 210 degrees for around 8 minutes. Finely chop the olives, dried tomatoes, basil, sprinkle over the cooked courgette strips, toast cedar nuts, sprinkle over the courgette strips and serve with mozzarella or grated parmesan.

Courgette spaghetti

Variant: Shred the courgette into spaghetti, fry briefly in a little oil (olive), finely chop the garlic and add, drizzle with lemon juice and season with salt, pepper, stir in 1 tbsp almond butter, remaining ingredients as above. Also cook 250 g emmer spaghetti and mix with the courgette spaghetti.

Spinal straightening orthoses support therapy

Pay attention to important details in everyday life.

Ergonomically moulded shoulder straps and gripping aids on the abdominal fastener ensure simple donning and doffing.

The pivot joint disconnects the back splint from the hip strap – for a secure fit and high user comfort in motion.

The orthoses work best when you are physically active (for example, when going for walks).

Do not wear the orthosis when lying down. You can take the orthosis off when lying or sitting down for a longer rest.

Wearing the orthosis regularly activates the muscles. This may cause muscle soreness. However, just like when exercising, the muscle soreness decreases as you get stronger and ultimately disappears completely.

You can find tips and tricks on how to use spinal straightening orthoses in everyday life on our website: www.medi.biz/spinomed-handling

More information
www.medi.biz/spinomed-handling

Tip – duration of orthosis wear

Get used to wearing the orthosis slowly. This means that the you wear the orthosis for a little longer each day and train the muscles gently. Depending on your individual constitution, it is sufficient to begin with an uninterrupted wearing time of around 30 minutes, which you gradually increase to one to two hours a day. You can also wear the orthosis for longer later on.

If you experience lasting muscle soreness despite using the orthosis correctly, please consult your doctor.

Proven effectiveness

The effectiveness of two special spinal straightening orthoses was demonstrated in clinical trials.[1, 2]

- **Stronger muscles**
  The activation of the back and abdominal muscles creates a training effect. The studies show: The back and abdominal muscles were strengthened by up to **73 per cent** and up to **58 per cent** respectively within six months. Strong muscles make you more mobile.
- **More upright posture**
  Thanks to the biofeedback principle, you straighten your upper body using your own muscle strength. This reduces the "angle of kyphosis" (by up to **11 per cent**), which characterises the curvature of the thoracic spine.
- **Less pain**
  The pain is also significantly alleviated due to the stronger muscles and straighter posture. In studies, patients report up to **47 per cent** less pain.
- **Easier breathing**
  Thanks to the straighter posture and the stronger muscles, you can breathe more easily again and have more strength for everyday activities.
- **Sure footing**
  You are also much more stable when standing. The tendency to sway is verifiably reduced (by up to **25 per cent**). The risk of falls can be reduced.

[1] Pfeifer M et al. Am J Phys Med Rehabil 2004;83(3):177–186.
[2] Pfeifer M et al. Am J Phys Med Rehabil 2011;90(10):805–815.

Spinal straightening orthoses as a backpack or body version

German DVO Guideline

Guidelines 2017

DVO stands for "Dachverband Osteologie e.V., an Umbrella Organisation of German Scientific Osteology-related Societies". In its current Guidelines 2017 (prophylaxis, diagnostics and osteoporosis therapy in postmenopausal women and in men), the Dachverband Osteologie e. V. (DVO) expressly recommends use of spinal straightening orthoses within conservative osteoporosis therapy.[3]

For the first time, this guideline refers to the two clinical trials on spinal straightening orthoses.[1, 2] These verifiably strengthen the muscles in the torso and abdominal area, alleviate pain and increase your mobility. You also benefit from greater fitness, can breathe more freely again thanks to the straighter posture and gain more quality of life.

Contact with self-help groups

Taking part in a self-help group offers many advantages.

A self-help group usually combines a community, active training, a discussion of shared interests, information about the illness and friendly support.

Motivating each other
Through the group, you access advice and personal assistance provided by patients for patients and can interact with each other. The interaction does not necessarily only focus on the illness, as shared activities offer variety and entertainment.
Ask your doctor or therapist or find out on the internet where the nearest support group is in your area.

[3] DVO. Prophylaxe, Diagnostik und Therapie der Osteoporose bei postmenopausalen Frauen und bei Männern 2017;196–201. Online veröffentlicht unter: http://dv-osteologie.org/uploads/Leitlinie%202017/Finale%20Version%20Leitlinie%20Osteoporose%202017_end.pdf (Letzter Zugriff 17.06.2021).

The osteoporosis identification test

What factors increase the likelihood of suffering from osteoporosis?

Osteoporosis can be triggered by various factors, which we divide up into factors that can and cannot be influenced:

Factors that cannot be influenced
- Genes
- Age

Factors that can be influenced
- Low body weight: Body mass index (BMI) below 20
- Calcium and/or vitamin D deficiency
- Smoking/regular alcohol consumption
- Little physical activity

You can use our test to check whether you have an increased likelihood of suffering from osteoporosis. *

Your result

Risk of suffering from osteoporosis:
Low (up to 19 points)
Moderate (up to 29 points)
High (more than 29 points)

Cross as applicable and then add the points together:		
I am over 50 years of age	☐	1
I am over 65 years of age	☐	2
I weigh less than 10 kg below normal weight	☐	2
My height has decreased by more than 4 cm	☐	2
I don't do any exercise	☐	1
I have a sedentary job	☐	1
I am immobile (long periods of bed rest)	☐	3
I smoke more than 10 cigarettes per day	☐	1
I drink more than 2 alcoholic drinks per day	☐	1
I drink more than 4 cups of coffee a day	☐	1
I drink sweet soft drinks (cola, etc.) every day	☐	3
I consume little milk and few dairy products	☐	1
I eat a lot of fast food	☐	1
I have immediate relatives with osteoporosis	☐	1
I have immediate relatives with fractures caused by osteoporosis	☐	2
I menstruated for less than 30 years	☐	1
I stopped menstruating for a longer period of time	☐	1
I have had chemotherapy	☐	4
I have had cortisone treatment	☐	3
I have had a gastric resection	☐	4
I have a sex hormone deficiency	☐	1
I have hyperthyroidism	☐	1

* Note: This questionnaire replaces neither a personal consultation with a doctor nor a medical diagnosis.

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