

A lift for your joints

Agricultural Working Environment

2010



Ruined by arthritis

...Bo used to be a pig producer – 600 sows plus finishing pigs. And he had counted on continuing being that for many years. But then he developed arthritis in one shoulder. It got worse and it was necessary for him to take pills against it. An operation helped, but then the other shoulder started up. A new operation and a new while without pills – just until arthritis struck again, this time in the back. Every time he tried to work physically he was ill for days.

Now the farm is for sale and Bo is taking a new education where he can use his experience as a farmer. But it was a farmer that he actually wanted to be...

Injuries in numbers

During the years 2002-2009 the “green sector” reported 1.157 work related injuries to the motor apparatus (bones, joints and muscles). Half of these were injuries to shoulders and arms while about a third of the injuries were back injuries.

Bones, joints and muscles

This is how they are threatened

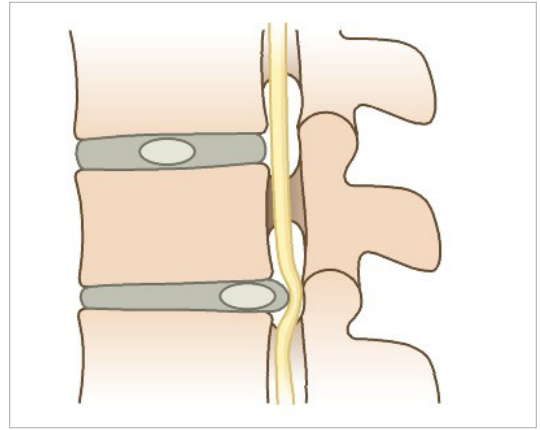
The spine

The spine consists of vertebrae placed on top of each other. Between each vertebra is a disk of cartilage that serves as a shock absorber and ensures mobility. If a disk is stuck the soft centre can be squeezed out (what you call a slipped disc) which leads to pressure on the nerves and to radiating pains.

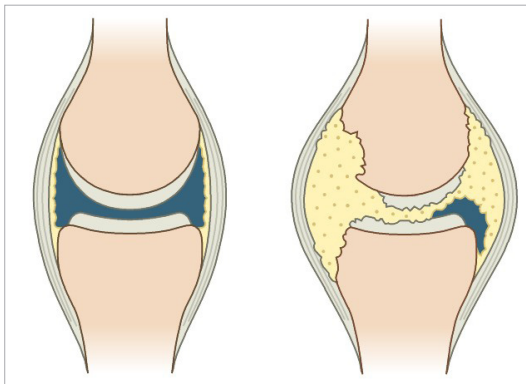
Injuries that threaten your back

Acute injuries: Typically happens when lifting heavy loads.

Chronic injuries: Typically come about from enduring monotonous work.



Normal disc (above) and a stuck disc threatening to turn into a slipped disc (note the pressure on the nerve).



Arthritis – a mean disorder

Arthritis means that the cartilage in your joints is worn down. The cartilage is there to ensure that your bones can be moved without friction. If the cartilage is more or less gone it will cause severe pain when the bones rub against each other during physical work. In the worst case the bones can be eroded.

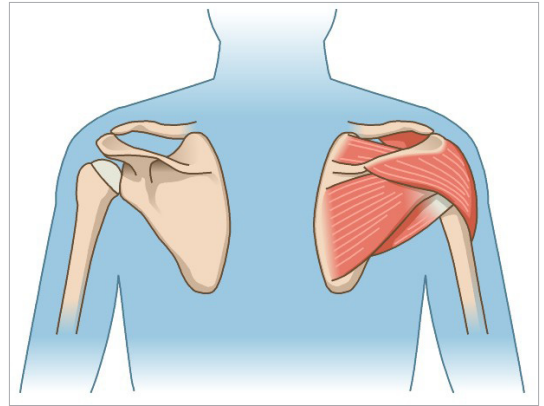
Arthritis can occur in all joints in your body.

Shoulders

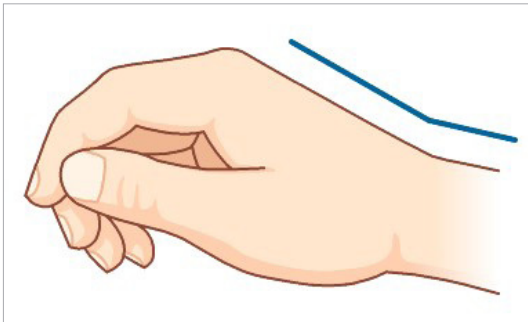
The shoulder can be moved in all directions. The contact area between each bone is small. They are controlled and stabilised by muscles and tendons.

Injuries

... to the shoulders are especially tendon and muscle injuries plus inflammation of the bursas. The injuries will typically occur if you lift or carry burdens at a distance from your body or if you work for longer periods with your arms above shoulder height. Bursas are found in places that are subjected to pressure and wear, typically between a bone and a tendon, between two or more tendons, or between skin and tendon. They reduce the friction and pressure. Inflammation of a bursa is very painful.



Shoulder joint – the joint can be moved in all directions.



Injuries to wrists can be prevented by using them "neutrally" – i.e. avoid the wrist's being bent upwards, downwards or to the side. Let the movement take place in the hand, the fingers or the arms.

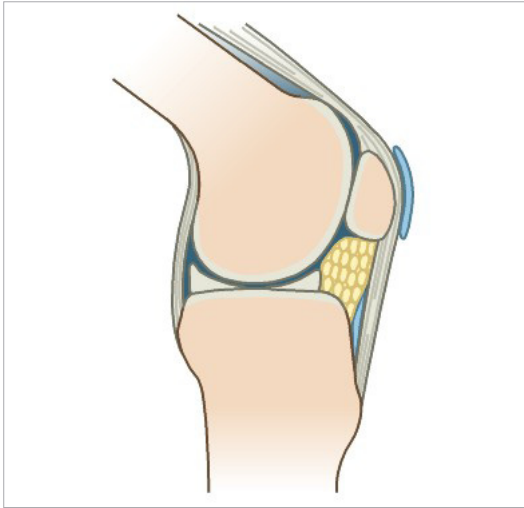
Hands

The muscles of the hand are situated in the hand as well as in the lower arm.

Injuries

... to hands and the muscles of the hands are:

- Tenosynovitis
- Tennis elbow
- Arthritis in the thumb



The knee is very strong if used correctly.

Knees

Each knee contains two slices of cartilage, the meniscus. They ensure that the big leg bones work together in the joint.

Injuries

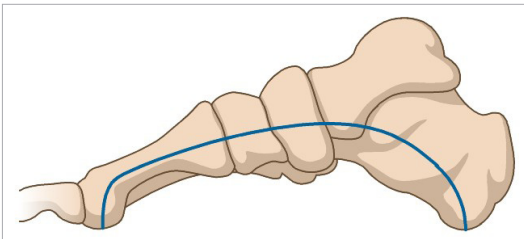
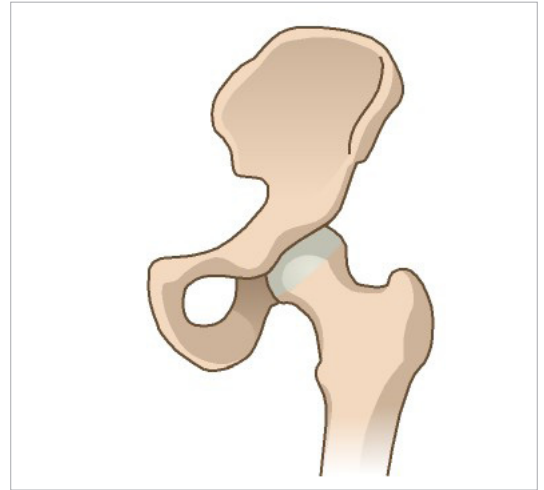
Overtaxing can lead to fissures in the meniscus. This leads to the knee locking and causes pain. Long term overtaxing the knees can lead to arthritis, which will make even ordinary movements very painful.

Hips

The hip joint is a ball-and-socket joint and thus very flexible

Injuries

Constant or repeated overload can lead to arthritis in the hips in the long run.



Feet are arched. Flatfootedness leads to the arch being straightened because muscles and tendons in the arch of the foot collapse. Flat feet change the feet's balance and influence your walk.

Feet

The arched form of the feet provides suspension and makes the feet able to carry the body's weight.

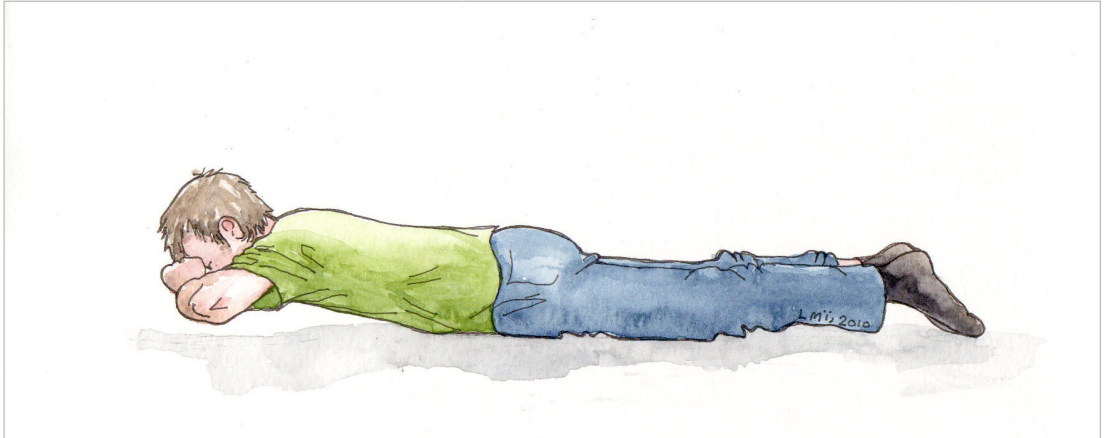
Injuries

Swelling of bursars from working on a hard surface or because of the wrong kind of shoes. This may lead to flatfootedness in the long run.



How you prevent injuries

You can strengthen your body to make it resist injuries. You do that by exercising it through other movements and loads than the ones you are subjected to at work. First and foremost this goes for back- and stomach muscles. Below you will find a couple of exercises.



Back exercise

- Lie on your stomach with your hands under your brow.
- Lift your head, arms, and upper body slowly as high as you can.
- Slowly lower them again.
- Repeat as many times as you can.

Stomach exercise

- Lie on your back with your knees bent and your feet on the floor.
- Squeeze the muscles of your pelvis tight and flatten the arch of the small of your back.
- Hold that position and slowly lift your head and upper body.
- Slowly lower your head and body and then release the muscles of your pelvis.
- Repeat as many times as you can.

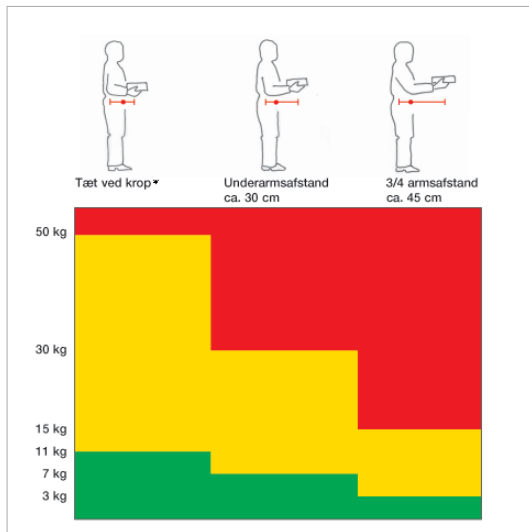
Change between these two exercises for 3-5 rounds.



You can stand this much

No matter how strong you are there are limits for what your joints can stand. On the "lifting staircase" below you can see when you are in the safe area (the green field), and when you subject your body to harmful loads (the yellow and red fields).

The joints of the body tolerate loads best when in a neutral position (no stretched arms, twisted torsos, resting on the wrist, standing on your toes etc.) The cartilage is thickest in a neutral position, and the tendons and muscles are not stretched.



The lifting staircase.

Examples of neutral lifting in relation to lifting with a twist in the torso measured on the third vertebra of the small of the back while standing.

Neutral lift	Lifting while twisting the torso
Lifting 10 kg	175 kg 350 kg
Lifting 20 kg	250 kg 500 kg
Lifting 30 kg	325 kg 650 kg
Lifting 40 kg	400 kg 750 kg
Lifting 50 kg	475 kg 850 kg

In an upright position without load the weight is 100 kg.

Loads

– people are not alike

Not everyone can lift the same loads.

Persons under 18 years of age are not allowed to lift more than 12 kg. If the lift is done close to the body 25 kg may be accepted as an exception.

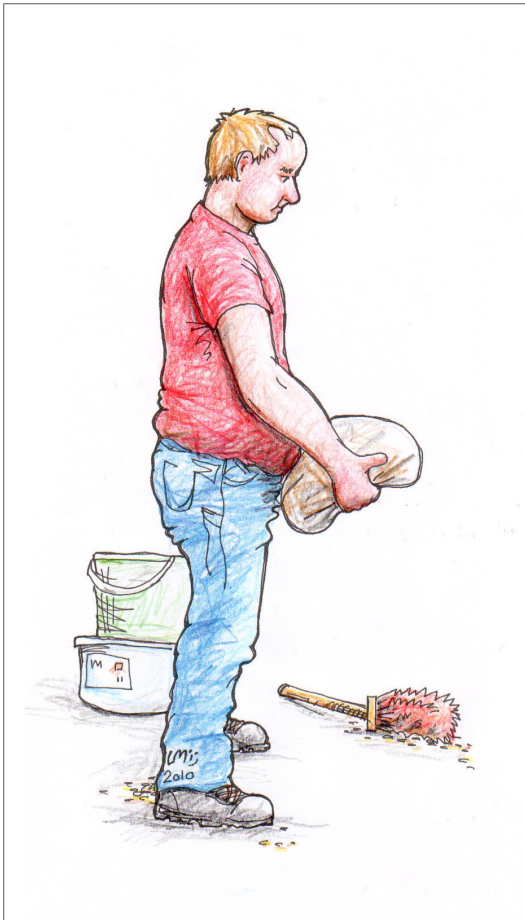
Pregnant women should totally avoid heavy loads. From the fourth month of pregnancy lifting more than 10-12 kg can be risky.

Lifting together

– both bad and good

Being more people about lifting heavy things can be a good way of avoiding individual overloads. But it can be hard to attain the right neutral position. And should the load slip for one of the people carrying, the jerk can give a sudden and unexpected load for the others.





The further away from the body the load is carried the more the back muscles have to work to keep the body balanced. The pressure on the spine will be considerably bigger from when you hold the load close to your body. The size of the stomach is of importance, too, when it comes to carrying a load close to your spine.

Don't lift in the chart's red field

If you don't know it, your body will raise the alarm – sooner or later. Lifting loads in the chart's red field will ruin your mobility and your life as a farmer. Below you can see ways of lifting a newborn calf.

Se more examples of good lifting on www.barjord-tilbord.dk/tungeløft.



One person must not lift a newborn calf, because the elbows can't be kept close to the body while lifting and the height of the calf is responsible for the man having to half kneel and stand slightly bent.

A newborn calf can be lifted by two persons by them grabbing the calf's codes on fore and hind legs. During most of the lifting they can lift with their arms at about three quarter's length from the body.

Aggravating conditions in both situations:
An uneven surface that may be slippery as well.
A calf is a living thing – it moves and its fur is wet.

Solutions:

Let the calf walk by itself.

Use a transport cart or miniloader if the calf is not able to walk by itself. Pull and turn the calf into the wagon by laying one foreleg around its neck and grab the upper part of the calf's forelegs.



Ground principles for lifting

Symmetry:

- stand with your front towards the load and go as close to the load as possible.
- distribute your body weight evenly on both legs.

Balance:

- stand with your legs a little more than hip distance apart.
- tighten the muscles of your pelvis while and just before lifting

Variation:

When doing the same work for longer periods:

- Change your working position regularly.
- Take small breaks regularly.

Generally:

- Use the stronger leg muscles instead of your back
- Avoid lifting and working below knee height and above shoulder height.
- Always make sure to work and lift with a straight back.

Work Place Assessment, WPA

Demanding lifting situations must be included in the WPA. Evaluate the risk of physical work and write in the WPA which technical aids or changed working methods could lessen the demands on your body.

Prepared by working environment adviser Karin Strudsholm and physiotherapist Lars Chr. Schmidt.
Illustrations: Line Margareta Iversen, Forlaget Landsvalen.dk and "Arbejds miljø", Landbrugsforlaget.
Layout: Marianne Sørensen, Print: GP Tryk, Grenå.





KNOWLEDGE CENTRE FOR AGRICULTURE

Planning & Environment

Agro Food Park 15 T +45 8740 5000
8200 Aarhus N F +45 8740 5010
Denmark vfl.dk

