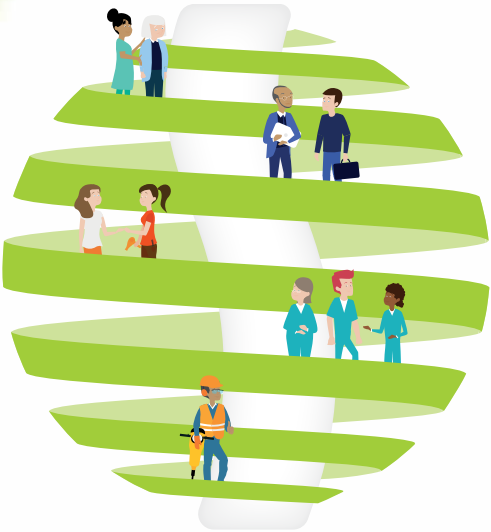

WORK-RELATED MUSCULOSKELETAL DISORDERS

A handbook for employers, workers and their representatives

REPUBLIC OF SLOVENIA
MINISTRY OF LABOUR, FAMILY SOCIAL AFFAIRS AND EQUAL OPPORTUNITIES

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Healthy Workplaces

INTRODUCTION

The present handbook was put together, based on research papers written by trainee specialists in occupational, traffic and sports medicine. When the European Agency for Safety and Health at Work (EU-OSHA) announced that the next campaign—the Healthy Workplaces Campaign 2020–22—will focus on the prevention of work-related musculoskeletal disorders, we decided to collaborate with the Ministry of Labour, Family, Social Affairs and Equal Opportunities of the Republic of Slovenia in order to draw up a handbook for employers, workers and their representatives, human resources staff and occupational safety and health experts, which will also prove useful to our colleagues, as well as specialists in occupational and general medicine.

In collaboration with trainee specialists in physical and rehabilitation medicine, students of all years of specialised training in occupational health, traffic and sports medicine have presented the following topics in six short sub-sections:

1. problems related to the fourteen most common musculoskeletal disorders;
2. conditions in workplaces where such problems occur most frequently, as a basis for preventive measures;
3. early treatment and rehabilitation;
4. staying physically active;
5. psychosocial factors and their impact on returning to work and
6. promoting good muscle health.

They have presented in a clear way the main characteristics of musculoskeletal disorders and provided guidelines for early detection and treatment, as well as included short exercises to strengthen and, above all, prevent these disorders.

As Slovenia does not yet have a register of occupational diseases and clear criteria for their recognition, we invited trainee specialists from the Medical Faculty of the University of Zagreb to present the extent of problems associated with musculoskeletal disorders in Croatia, where the verification of occupational diseases and the register of such diseases is kept by a special institution. We estimate that a similar proportion of occupational musculoskeletal disorders could be expected in the Slovenian working-age population. Their data allowed us to underpin the importance of our work and present key aspects in the education of all persons responsible for occupational safety and health.

In each section, the authors present some specific features that are characteristic of individual disorders in the process of returning to work. In order to make this handbook a practical tool for preventing musculoskeletal disorders

in the workplace, trainee specialists in physical and rehabilitation medicine have prepared exercises that are appropriate for an active break in the workplace.

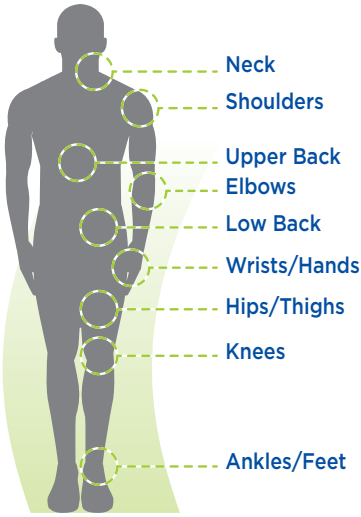
In this regard, we should also mention the EU-OSHA publication Work-related musculoskeletal disorders: prevalence, costs and demographics in the EU.[1] The publication emphasises the significance of psychosocial risk factors: »Very often, when organisational and psychosocial risks are assessed at the workplace level, this is done in isolation, focusing purely on the mental health consequences of 'stress' without considering their impact on other risks or other health problems, such as musculoskeletal pain. As workers are exposed to multiple MSD risk factors at the same time, one-dimensional risk-outcome approaches (based on the relation between a single risk factor and a single outcome measure), should be avoided as part of the risk assessment process, opting instead for more holistic approaches. The challenge is to transfer the existing knowledge into workplaces in order to get past the obstacles in MSD risk assessment and psychosocial risk assessment. Guidance and risk management tools that integrate these dimensions should be put at the disposal of employers and workers at the workplace. Psychosocial risk factors such as stress, anxiety, sleeping problems and mental well-being may play a role in the onset of MSDs. However, research suggests that they play an especially important role in the progress of the chronicity of MSDs, from acute (reversible problems) to chronic. This means that psychosocial risk factors have to be taken into account when assessing and preventing MSD risks (primary prevention), but above all when the first symptoms of musculoskeletal pain appear. By improving the way work is organised and the social climate, enterprises also contribute to MSD prevention. It is important to increase awareness at the workplace level about this interrelationship and to encourage actors in the field to consider the prevention of MSDs when introducing changes in work organisation or when preventing exposure to psychosocial risks.«

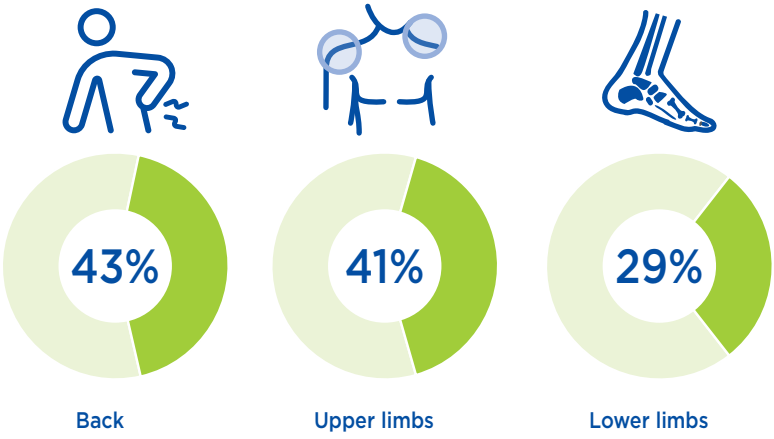
This is precisely what our handbook aims at. We hope that the readers read this handbook with the same amount of interest as shown by the authors when writing it and examining the literature and experience in the field. Some of them have already become young specialists now that the handbook is published, and they are entering the professional world with dedication, while others are completing their training. In this handbook, we have kept their initial titles because their work was done while they were still in the process of training.

Editor

1 Available at: https://osha.europa.eu/en/publications/msds-facts-and-figures-overview-prevalence-costs-and-demographics-msds-europe/view

Body map showing the parts of the body typically affected by MSDs





Source: European Agency for Safety and Health at Work

NECK PAIN

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1. Identifying the problem

Non-specific neck pain can be defined as any form of neck pain that is not caused by anatomical abnormalities or other problems. Typical symptoms that vary over time comprise pain intensity, stiffness and tenderness of the neck, reduced range of motion, but may also include headaches, dizziness, tinnitus, sleep and mood disorders and shoulder pain. By definition, acute pain is pain that has been present less than 4 weeks, chronic pain is pain that persists for more than 6 months, while sub-acute pain refers to pain that lasts for a period in between (1).

The occurrence of neck pain is increasing especially among workers in industrialised countries. At present, 10–20% of the population suffers from such problems. Neck pain is one of the most common causes of long-term sick leave and retirement due to disability, which leads to high costs both for individuals and society (2, 3).

The development of neck pain is influenced by physically demanding work, forward head posture and prolonged sitting at work. The repetitive strain of the neck combined with poor ergonomic postures and inadequate work equipment may lead to work-related musculoskeletal disorders and increase the risk of chronic neck and shoulder pain (2, 3).

2. Conditions in the workplace – a basis for preventive measures

Neck pain is associated with individual factors (gender – primarily women, age, physical inactivity) and workplace factors (head tilt greater than 20°, repetitive head movements, raising arms to and/or above shoulder height, lifting loads heavier than 15 kg, long sedentary work). It may also be brought on by a number of psychosocial factors in the workplace (4).

Preventive measures should aim towards improving ergonomic conditions in the workplace and, as such, may include ergonomic chairs that support the spine,

alternating between work from a sitting and a standing position, correct placement of the screen, etc. Workers' rest breaks also play an important role (4).

3. Early treatment and rehabilitation

The most effective treatment has proven to be one that involves at least two different types of therapy. It is essential for rapid patient activation to be combined with exercises and analgesic therapy (1).

During the acute and sub-acute phase of pain, stretching exercises should be encouraged despite persistent pain symptoms, as they improve soft tissue circulation and reduce discomfort. Initial exercises may include stretching, isometrics and movements within a pain-free range of motion, and should be performed at least three times a week. It is vital to begin working out using your own body weight and doing exercises to improve posture as quickly as possible after the acute symptoms subside (3).

4. Staying physically active

When the full range of motion has been restored through rehabilitation, especially physiotherapy, treatment should focus on exercises to strengthen and stabilise the muscles in the neck, shoulder and upper torso, for which sets of resistance training exercises, such as exercises with weights, were found to be particularly effective (3).

When neck pain symptoms become chronic, it would be best to employ a multidisciplinary approach to treatment. Individuals with chronic neck pain were found to benefit from exercising under professional supervision, specifically from performing strength training exercises, dynamic resistance training exercises, stretches and proprioceptive training. Research has not been able to confirm the effectiveness of exercise without professional supervision and group exercise activities (1, 3).

5. Psychosocial factors and their impact on returning to work

Neck pain can adversely affect functional capacity and quality of life, as well as lead to excessive worry, anxiety and depression. The condition can be significantly aggravated by work-related psychosocial factors, such as high psychological demands, low level of autonomy, heavy workloads, low social support and low job satisfaction. All of the above can result in the development of a complex disorder that is caused by the intertwining of physical, mental, social and other factors and may lead to long-term incapacity for work (1, 5).

6. Promoting good muscle health

An important role in the prevention of neck pain is played by ergonomic adjustments and exercise programmes in the workplace. The best results are achieved with resistance training exercises for the neck and shoulders, while all-round physical activity is less effective. Merely advising workers to exercise is not effective. The effectiveness of exercise in the workplace is increased when combined with healthy lifestyle changes and leisure-time physical activities (3, 5).

Other meaningful measures that can be adopted in the workplace include remedying the uneven distribution of working time and reducing overtime, reducing the number of fixed-term employment contracts and providing support to workers in finding a balance between work and their private lives. Programmes aimed at preventing harassment and mobbing in the workplace and creating a healthy work environment are also important (5).

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Neck exercises for an active break in the workplace

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To perform the exercises, find a comfortable position to sit upright and activate your core and pelvic floor muscles. Do these exercises twice a day and gradually increase the number of repetitions. Keep your breathing relaxed.

Exercise 1

As you exhale, tilt your head forward to feel a slight stretch in the back of your neck. Hold for 10 seconds and, inhaling, return your head to an upright position. Repeat 3–5 times. You can increase the stretch by placing your hands on your head and applying gentle pressure. Hold again for 10 seconds and repeat 3–5 times.

Exercise 2

Lift your chin as high as you can and tilt your head backwards. Make sure to keep your back straight. Perform the exercise slowly and carefully. Hold the position for 10 seconds and repeat 3–5 times.

Exercise 3

Tilting your head sideways, bring your ear towards your shoulder to feel the stretch on the opposite side. Hold the position for 10 seconds and then switch sides. Repeat 3–5 times. To intensify the stretch place your hand on your head and gently apply pressure. Repeat 3–5 times on each side.

LOWER BACK PAIN

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1. Identifying the problem

Lower back pain is the second most common cause of sick leave after respiratory infections. From 60% to 80% of the population experiences lower back pain at least once in their lifetime (1). There are a number of causes of lower back pain. As many as 85% of people with lower back pain never receive a clear diagnosis of what is causing the pain. Only a small percentage of lower back pain problems can be attributed to serious diseases. The vast majority of causes are mechanical and comprise strains or sprains of lumbosacral muscles and ligaments, disorders affecting intervertebral discs, intervertebral joints and vertebrae, and postural abnormalities (scoliosis). In many cases, it is not clear which structure is defective and where the pain is coming from. The pain is usually localised diffusely in the lumbar region, but may radiate to the buttocks and thighs. Most often, the pain worsens with physical activity and improves with rest.

2. Conditions in the workplace – a basis for preventive measures

As there are numerous risk factors for lower back pain, a direct causal link is difficult to establish. Among the most common risk factors are age, obesity, pregnancy, scoliosis and poor physical fitness. Other significant risk factors comprise physical burden and workplace stress (2). Studies have proved the correlation between lower back pain and specific job tasks, such as heavy lifting, repetitive movements, forced posture, sitting for prolonged periods of time and exposure to vibration (3). Important psychosocial factors include work-related stress and low job satisfaction. Those most at risk of developing lower back pain are workers in the construction, agriculture, healthcare, transport and manufacturing sectors.

3. Early treatment and rehabilitation

With lower back pain, early detection and rehabilitation are of utmost importance and were found to be the most effective aspects of treatment. Non-specific lower back pain is usually treated conservatively with simple pain medication and non-steroidal anti-inflammatory drugs. In the acute phase, doctors also prescribe rest. There is no solid evidence regarding the effectiveness of orthoses (braces) and so-called cosmodiscs, which some people use to relieve the pain.

4. Staying physically active

The aim of early rehabilitation is to reduce pain and to promote an active lifestyle with regular exercise that allows the individual to retain spinal strength and mobility.

Rest may be prescribed only during the acute phase of pain (up to 7 days); however, the individual is encouraged to keep active within pain limits. Patients should start physiotherapy as soon as possible. At the beginning of physiotherapy, they will receive instructions on how to relieve pressure on the spine and, in the later sub-acute phase, they will learn to carry out exercises for the spine, which they should also regularly perform at home. If an individual suffering from lower back pain is on sick leave, it is advisable to do an ergonomic assessment of the workplace and to take measures that would facilitate the individual's return to work.

5. Psychosocial factors and their impact on returning to work

There are a number of factors influencing the recovery and the time it takes for a person to fully return to work. The two most important factors that affect the ability to return to work are the severity of the condition and the type of work. Other factors that have an effect on the persistence of lower back pain include age, muscular fitness and psychosocial factors (occupation, job security, financial security, individual's psychological profile, workplace stress, job satisfaction, etc.). Among the factors affecting the reoccurrence of lower back pain are high levels of work-related stress, poor mental health, severe first episode of pain, spinal deformities and frequent job change. As many of the risk factors for lower back pain are psychosocial, it is important that the employees' treatment encompasses this aspect as well (involvement of the HR department, a psychologist, an occupational medicine specialist and, if necessary, a psychiatrist).

6. Promoting good muscle health

In recent times, alarming data shows that lower back pain is occurring more frequently in children and teenagers, which is associated with heavy school bags, poor posture, excessive playing of computer games and sedentary lifestyles (5). It is therefore vital to raise awareness among children and young people about the importance of health care and the prevention of musculoskeletal disorders, and teach young workers and new employees how to protect their health and safety in the workplace as soon as they start working. Firstly, it is important to create an ergonomic workspace and properly schedule work breaks. Heavy physical work requires passive breaks, while sitting or static work in forced positions requires active breaks. Workplace ergonomics is also improved by reducing work-related stress, which can be achieved through good work organisation, an even distribution of work among employees and teamwork. It is further important to encourage workers to break bad habits and adopt a healthy lifestyle.

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Lower back exercises for an active break in the workplace

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To perform the exercises, find a comfortable position to sit upright or stand near a wall or a chair for support. Focus on activating the deep abdominal muscles and the pelvic floor muscles before beginning the exercises. Do these exercises twice a day and gradually increase the number of repetitions. Keep your breathing relaxed.

Exercise 1

Start by standing tall with your feet shoulder-width apart. Place your palms on your lower back for support. Slowly lean backwards, increasing the lower back arch until you feel a mild stretch in your abdominal muscles and a slight pressure in your lower back. Hold the position for 15–20 seconds and repeat the exercise 3–5 times.

Exercise 2

Start in a seated position with your feet flat on the floor and parallel to each other. Place your right hand on the armrest or on your right thigh and raise your left arm over your head. Slowly bend to the right side until you feel a stretch along the opposite side of your torso. Hold the stretch for 30 seconds and breathe comfortably. Repeat 3–5 times on each side.

Exercise 3

Start in a seated position with your feet flat on the floor and parallel to each other. Place your hands on the back of your neck or head so that your elbows are facing out to the sides. Rotate your torso to the left while gently pulling your shoulder blades down. Hold for 15–20 seconds and return to the starting position. For the next repetition, rotate the torso to the opposite side. Repeat the exercise 3–5 times on each side.

SHOULDER PAIN

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1. Identifying the problem

According to some estimates, as many as 18–26% of the population experiences shoulder pain at least once in their lifetime (1). The most common cause in adults is rotator cuff syndrome, a chronic pain syndrome that originates in four muscles and their tendons (2, 3). Approximately 13% of all shoulder problems are workplace-related (4). Simultaneous exposure to multiple different risk factors in the workplace poses a higher risk of rotator cuff disorder (1).

2. Conditions in the workplace – a basis for preventive measures

Jobs where the risk of rotator cuff syndrome is particularly high are those that require raising arms to or above shoulder height, lifting heavy loads and—in certain professions—making rapid and repetitive arm movements, as is the case for seamstresses, slaughterhouse workers, welders, carpenters, construction workers and production workers (3,4). Studies show that preventive measures in the workplace can help prevent the occurrence of rotator cuff syndrome (2). The most effective interventions have proven to be workplace exercise programmes, which yielded the best results in terms of reducing shoulder joint pain. On the other hand, there is little solid evidence of effectiveness of ergonomic improvements in the workplace, which is probably due to the small number of studies addressing this topic and, in particular, the fact that the benefits of ergonomic improvements are not immediately evident.

3. Early treatment and rehabilitation

As is the case for all musculoskeletal disorders, the goal of early rehabilitation for rotator cuff syndrome is to decrease pain and inflammation and to reduce stress on the affected tissues. This is achieved through pain medications, cold compresses, physiotherapy and workplace adjustments aimed at eliminating the factors that contribute to the development of rotator cuff syndrome (3). In severe cases, surgery should be followed up by physiotherapy. It is important

that the patient achieves a better range of motion and is able to abduct the shoulder to 90 degrees as quickly as possible. Various factors can influence the length of rehabilitation, including possible complications, age, underlying diseases, severity of symptoms (bilateral disorder, dominance of the affected limb), underlying psychosocial factors and workplace-related factors.

4. Staying physically active

Shortly after the onset of symptoms and signs of disease, the worker should be encouraged to resume their usual daily activities as soon as they are able to. The worker should be reminded that activity levels are to be increased gradually and within pain limits. At the same time, the worker should be actively involved in the process of gradually returning to work and, if possible, return to the same job they held before the occurrence of the disease (4).

5. Psychosocial factors and their impact on returning to work

Studies have demonstrated a correlation between psychosocial risk factors and rotator cuff syndrome (2, 4). Most studies examined the relationship between psychosocial risk factors and shoulder pain, however in combination with neck pain. Psychosocial factors associated with an increased risk of shoulder pain include poor self-evaluation of health, stress, high psychological demands at work, low level of autonomy, low job satisfaction, little social support, depression, smoking, low socio-economic status and poor work organisation (5). According to the results of studies, psychosocial risk factors have an impact on both the length of sick leave and the process of returning to work (2, 4).

6. Promoting good muscle health

Preventing the health burden of shoulder pain requires a team effort and the active involvement of employers, occupational health and safety experts, specialists in occupational medicine, general physicians and the injured workers (2). Ergonomic principles should be observed when setting up new workstations and adapting old ones. To prevent shoulder pain, workstations must be organised in a way to avoid work above shoulder height. Objects needed for work must be easily accessible by hand. If shoulder pain occurs despite the preventive measures, the affected worker must be quickly identified, treated and actively involved in rehabilitation, of which the process of returning to work should be an integral part.

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Shoulder girdle exercises for an active break in the workplace

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To perform the exercises, find a comfortable position to sit upright and activate your core and pelvic floor muscles. Do these exercises twice a day and gradually increase the number of repetitions. Correct execution is more important than a higher number of repetitions. Keep your breathing relaxed.

Exercise 1

You can perform this exercise while sitting or standing. Clasp your hands in front of you and raise your arms above your head as high as possible. Turn your palms upwards and straighten your elbows. Turn your palms down and lower your arms to starting position. Repeat the exercise 4 times.

Exercise 2

You can perform this exercise while sitting or standing. Lift your arm in front of you to shoulder height. Pull the arm slightly toward you with your other arm, holding it just above the elbow. Hold for 10–20 seconds. Repeat the exercise with the other arm.

Exercise 3

Hold a stick with outstretched arms and hands shoulder-width apart (in front of your body, hands at thigh level). With arms straight, slowly bring the stick above your head and then pass it behind your head (bending the arms). This exercise is designed to increase mobility and blood flow in the shoulder girdle area. Repeat 10–15 times.

ELBOW PAIN

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1. Identifying the problem

Most muscles and tendons involved in wrist and finger movements are attached to the lateral or the medial epicondyle of the humerus. Physical factors causing chronic inflammation with consequent scarring (epicondylitis) include repetitive work which requires using force and puts stress on the elbow and forearm with more than 10 movements/minute or more than 600 movements/hour, poor ergonomics and forceful work involving high physical strain (1). As with all chronic musculoskeletal conditions, elbow pain is often associated with ageing and adverse lifestyle factors. The estimated prevalence of epicondylitis in the general population is 1–5%.

Lateral epicondylitis, or tennis elbow, is an inflammation of extensor tendons of the wrist and fingers at their insertion site on the lateral epicondyle. The term »tennis elbow« first appeared in 1883, as the injury was gaining prevalence in tennis players performing the backhand stroke. Lateral epicondylitis is five times more common than medial epicondylitis and it is estimated to occur in 0.6% of manufacturing workers, equally affecting both men and women.

Medial epicondylitis, or golfer's elbow, is an inflammation of flexor tendons of the wrist and fingers at their insertion site on the medial epicondyle. It is twice as common in men as in women (2).

2. Conditions in the workplace – a basis for preventive measures

Work-related epicondylitis often affects construction workers (masons, carpenters), food industry workers (bakers, cooks and butchers), workers on assembly lines (conveyor belt) and athletes (tennis players).

Preventive measures aimed at identifying and preventing risk factors that contribute to the development of the disease include the replacement of manual handling of loads with mechanised systems, automation and robotisation of processes, ergonomic measures for preventing forced wrist and elbow postures, tools with appropriate handle length that allows for optimal wrist po-

sition and better activation of the forearm muscles, job rotation for reducing the frequency of repetitive movements and monotony due to the imposed work pace, active breaks with stretches and exercises to loosen the muscles in palms, fingers and hands.

3. Early treatment and rehabilitation

Epicondylitis manifests as pain at the tendon insertion on the epicondyle of the humerus, while elbow range of motion is usually preserved. In chronic epicondylitis, the pain may radiate intro the wrist and possibly fingers. The diagnosis is confirmed by an ultrasound scan of the elbow joint, but a typical clinical picture is often enough. If the arm injured is the dominant arm, it may result in illegible handwriting, difficulty typing and poor fine motor skills, which poses a big problem if it occurs in laboratory workers and assembly line workers.

In the first week of rehabilitation, the patient has to stop performing movements that cause pain and avoid using their full range of motion. During the first 48–72 hours, the therapy should follow the PRICE principle (protection, rest, ice, compression, elevation) to reduce the swelling (3). It is recommended to use a brace that helps relieve pain, but only when the pain is unbearable. During the second week of rehabilitation, the affected area should be treated with warm compresses and physical therapy should start as soon as possible (3). Surgical treatment is not considered until all other treatment options have been exhausted; in the case of surgical treatment, recovery times are considerably longer. Prior to the worker's return to work, factors such as type of work, injury of the dominant/non-dominant hand and type of treatment should be taken into account. The duration of inability to work is significantly longer if the work requires frequent repetitive movements and intensive use of both hands. For highly demanding manual work, the work incapacity period is at least 28 days and can be extended up to two months (2).

4. Staying physically active

If work tasks are causing problems, an ergonomic assessment of the workplace as well as a re-organisation and/or modification of work tasks are required. It is very important to reduce repetitive movements. Once the worker is well enough to return to work, they should do so gradually, which means the work should be organised to include frequent breaks, their work tasks and tools need to be adjusted (e.g. handle length adjustment to allow optimal wrist position), they should rotate jobs and avoid using vibrating tools. If the problems were caused by leisure-time activities, these should be changed or abandoned.

5. Psychosocial factors and their impact on returning to work

Hippocrates emphasised that it is »more important to know what sort of person has a disease than what sort of disease a person has.« Sometimes muscle tensions can occur even if the work is not hard or repetitive. Limited autonomy over one's work as a source of stress could lead to the secretion of chemical mediators that cause muscles, veins and nerves to become tense, which results in the development of physical symptoms due to somatisation. If not combined with changes in the worker's routines, behaviour, emotions and exposure to constant stressors, the effects of treating physical symptoms are only temporary (4).

6. Promoting good muscle health

Promoting health in the workplace involves much more than simply meeting the legal requirements for health and safety at work (5). It is primarily an investment, not just an expense. It is essential that workers participate in the design of measures aimed at promoting health in the workplace and that their needs, views and suggestions regarding the organisation of work and the workplace are taken into account.

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Elbow exercises for an active break in the workplace

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All exercises are designed in a way that makes it possible to perform them during an active break at work. Adjust the number of repetitions for each exercise according to your physical capacity.

Exercise 1

Start in a standing position with your elbows at your sides and your palms facing up. Bend your elbows and then slowly extend them. You can perform this exercise with both elbows at the same time or by alternating them. To increase the intensity of the exercise, you can use small hand weights or a bottle of water. Adjust the number of repetitions to your physical capacity.

Exercise 2

The exercise is performed while standing. Stand at a table with your palms down, fingers pointing towards your body and elbows straight. Lean away from the table until you feel light a stretch on the inside of your forearm. Hold the position for 20 seconds and then release.

Exercise 3

Start in a standing position with your palms against a wall. Keeping your body straight, alternate between bending and extending your elbows to bring your upper body towards and away from the wall.

WRIST PAIN

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1. Identifying the problem

The wrist joint comprises distal ends of the radius and ulna, eight carpal bones and five metacarpal bones. It allows movements along three different axes, i.e. in six different directions. The passageway inside the wrist (carpal tunnel) is bounded by the carpal ligament on the palmar side of the wrist and the carpal bones on the dorsal side of the wrist. Running through the carpal tunnel are nine flexor tendons of the fingers and the median nerve, i.e. a mixed nerve that provides sensory innervation to the skin of the palmar side of the thumb, index and middle finger and the radial half of the ring finger, as well as motor innervation to the pronator muscles of the wrist, the flexor muscles of the first three fingers and the thumb and thenar muscles, which are responsible for the movement of the thumb (flexion and opposition). Most of the muscles that allow wrist and finger movements are located in the forearm. The tendons of these muscles run through the carpal tunnel to reach the hand. The long-distance transmission of high muscle force causes friction of tendons within the carpal tunnel. (1)

Carpal tunnel syndrome (CTS) is the most common form of peripheral nerve entrapment. It usually occurs bilaterally and can affect patients of all age groups. Women are three times more likely to suffer from CTS than men, which is presumably due to different hormone levels and the use of hormonal contraceptives, both of which cause tissue swelling. In addition to performing more household chores, women are also more often employed in jobs that carry a high risk of CTS. Prevalence of CTS in the general population ranges from 7–19%, meaning that it affects about one in five people; incidence rates are estimated at 1 per 1,000 person-years. (2–4).

2. Conditions in the workplace – a basis for preventive measures

The occurrence of CTS is influenced by several different ergonomic and biomechanical factors. Among the most important risk factors are deviated wrist

postures, which cause increased tendon friction; repetitive work tasks and increased frequency of work tasks; work that requires great strength in the palm or fingers (strong squeezing or gripping); work that involves pounding or striking an object with the heel of the palm (e.g. when assembling parts) and work with vibrating tools. There are many tools available on the market that are designed to significantly decrease the strain on muscles and tendons by reducing the force required to grip or squeeze (e.g. pneumatic screwdrivers, supports and holders for tools that reduce their weight, tools that require less force to use) and tools that minimize prolonged awkward wrist postures (e.g. split keyboard or asymmetric mouse). The risk of CTS occurrence is greatest in assembly line workers, gardeners, musicians, farmers, mechanics, factory workers, construction workers, foresters, cashiers, masseurs and upholsterers. (1, 2–5).

3. Early treatment and rehabilitation

The onset of CTS symptoms is gradual, starting with paresthesia in areas innervated by the median nerve. The CTS diagnosis is confirmed by electromyography tests. Laboratory tests are performed to rule out other medical conditions that may cause CTS. Initial treatment should include complete or at least partial cessation of activities that aggravate symptoms, wrist splint to wear at night, pain medications and steroid injections. Pain and numbness during the night indicate progression of the disease; patients also report stiff fingers, pinch strength loss and a tendency to drop objects. In this case, a surgical procedure to expand the carpal tunnel and to relieve pressure on the median nerve is required, where an incision of the transverse carpal ligament is made. Symptoms usually subside within a week after surgery, while the return to normal activities is recommended after approximately two weeks (3, 5).

4. Staying physically active

Rehabilitation includes physiotherapy and occupational therapy. The aim is to improve hand mobility and posture, as well as increase muscle strength. The resumption of work depends on the type of work, the degree of median nerve damage, the severity of symptoms prior to surgery and the success of the surgery and rehabilitation. Returning to work should be a gradual process. Lifting heavy loads and repetitive movements should be avoided for up to two months after surgery (3–5). Prolonged sick leave is observed in elderly patients, women and people with increased weight, underlying musculoskeletal disorders and lower levels of education.

5. Psychosocial factors and their impact on returning to work

Psychosocial risks include workplace-related factors (poor performance at work, risk of losing one's job, weak social network at work, high work demands and low level of autonomy in the work process) and individual psychosocial factors (psychiatric and behavioural disorders, dissatisfaction with health care, anxiety and tension). Realistic work requirements, a sense of achievement at work and a supportive social network in the workplace all contribute to a quicker and more successful return to work (1, 3, 4).

6. Promoting good muscle health

Among the most important CTS preventive measures is the ergonomic design of the workstation. Young workers should be advised to apply ergonomic measures and they should be encouraged to come up with solutions to make their work easier and prevent the occurrence of musculoskeletal disorders.

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Wrist exercises for an active break in the workplace

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All exercises are designed in a way that makes it possible to perform them during an active break at work. Adjust the number of repetitions for each exercise according to your physical capacity.

Exercise 1

You can perform this exercise while sitting or standing. Rest your forearm on a table or another flat surface, allowing your hand to hang off the edge. With your free hand, gently bend the wrist down to feel a mild stretch. Hold the position for 10 seconds and then release. Repeat the exercise with the other wrist.

Exercise 2

You can perform this exercise while sitting or standing. Bring your palms together in front of you and place your forearms horizontally on a flat surface. Press your palms into each other and hold the position for 5 seconds. Release, then repeat.

Exercise 3

You can perform this exercise while sitting or standing. With your elbow at your side and bent 90 degrees, make a fist with the thumb inside. Bend your wrist downwards and then try to bend it a bit more. Hold for about 30 seconds and release. Repeat the exercise.

THUMB PAIN

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AP Evexia

1. Identifying the problem

Due to the saddle shape of the basal joint, the thumb has significantly higher mobility than the other digits and can perform movements in three planes: flexion-extension, abduction-adduction and opposition. Opposition of the thumb is a movement unique to humans and represents about 50% of the total function of the thumb. As a result of its shape and mobility, however, the joint is relatively unstable and is the most commonly surgically treated joint of the hand (1, 2). Thumb joint damage most commonly occurs in women over the age of 55. Given the thumb's importance in performing a variety of movements, its amputation would reduce hand function by more than a third.

2. Conditions in the workplace – a basis for preventive measures

A work environment where frequent or continuous use of the thumb is required is a risk factor for the development of rhizarthrosis (degeneration of the basal joint). In particular, the risk is increased in occupations where it is necessary to perform specific gripping movements frequently and for a long period of time, and in occupations where high forces are generated because of the forced position of the thumb (3). Prolonged mechanical loads cause wear of the joint and the joint structures. Working with vibrating hand tools poses an additional risk, as such tools require a stronger grip on the handle for stabilisation purposes (4).

The aim of preventive measures should always be to enable the worker to return to the same work as quickly as possible. The automation of work processes is recommended, though semi-automated tasks are discouraged as they cannot be adjusted to the needs of individual workers. Workers must be well trained to perform their work and optimal conditions must be provided to avoid forced wrist and elbow postures. Tools should be as light as possible and be kept well-maintained and sharp. Arm support must be provided, especially for precision work. The tool handle must be of the appropriate dimen-

sions (thickness, length, shape, size) and have anti-slip protection. A properly designed handle allows better activation of the forearm muscles; lengthening the handle reduces the amount of force needed to operate the tool (longer handles, strap wrench). The workstation should be designed in a way that enables the task to be performed without using the thumb and, instead, the strongest joint available should be used. In the case of tasks that require many repetitive movements of the thumb, it is advisable to rotate tasks that involve different hand movements.

3. Early treatment and rehabilitation

Initially, the pain occurs during movements where a large force is created in the thumb joint (turning a key, closing a zipper, opening jars) and it gradually becomes present even while resting. As soon as an employee starts complaining about problems, a workstation assessment should be arranged to determine which tasks are causing the problems. An X-ray of the joint serves only to determine the degree of damage, while the clinical diagnosis is made on the basis of a clinical examination. Half of patients with rhizarthrosis also suffer from carpal tunnel syndrome (3).

4. Staying physically active

When a worker starts complaining of pain, it is necessary to assess and temporarily, i.e. until the symptoms subside, adjust their tasks and workstation. The purpose of initial conservative treatment is to reduce pain, maintain mobility, function and strength, reduce mechanical loads and preserve joint space. If improvement is achieved through conservative methods, intermittent use of a splint is advised when higher loads are expected. Surgery should be considered if there is no improvement after a couple of months. In the case of surgical treatment, rehabilitation is slow and gradual. The surgery is followed by a 6-week immobilisation period and only afterwards the patient may gradually start performing light exercise and daily tasks. Over time, they can increase the load and start making all movements involving the thumb (gripping, pinching and pulling). How successful the return to work will be depends on the type of work (office or manual work). For highly demanding manual work, it is possible to return to work after 3–6 months. Although light tasks can be performed relatively soon after surgery, it can take 6–12 months for normal sensation to return, while strength recovery may take several years (3).

5. Psychosocial factors and their impact on returning to work

Employment has a positive effect on the quality of life, but it may also negatively affect the health of the worker. Loss of employment due to illness is associated with lower sense of fulfilment and greater likelihood of depression and severe pain. Pain is complexly related to psychosocial factors, as these affect the perception of pain. Severe pain also affects psychosocial well-being, leads to reduced social interaction and poses a significant risk of job loss or disability. Work efficiency, the possibility of discussing problems with co-workers, the support of the manager, co-workers and family are all factors that contribute significantly to the successful return of workers affected by thumb pain to the workplace (5).

6. Promoting good muscle health

Due to the aging of the working population, changes are occurring in the state of health of employees that increasingly experience chronic problems and rarely enter the work process completely healthy. It is also necessary to look after the health of young workers and prevent them from leaving the labour market prematurely due to ill health. Cost-benefit analyses have shown that good health promotion in the workplace and appropriate ergonomic arrangements of the work environment contribute to higher employee productivity and thus to company success.

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TRIGGER FINGER

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1. Identifying the problem

Trigger finger refers to a finger or thumb feeling stuck or temporarily snagged during straightening or bending (1). When the digit does move as a result of increased effort or a passive movement, it produces a snapping sensation. Trigger finger is one of the most common causes of hand pain in the adult population. Prevalence in the general population is around 2% and is most common among women, on the right hand and between 40 and 60 years of age. It can occur in one or more fingers, most commonly in the third finger (2). It is caused by swelling of the tendon and the tendon sheath. It is accompanied by inflammation that narrows the sheaths through which the tendons glide and allow the movement of the hand and fingers, most frequently in the metacarpophalangeal joint. The irritation caused by the rubbing of the tendon against the walls of the sheath when the tendon encounters an obstacle and pulls free with further attempts at movement is felt as pain and a snapping sensation (triggering). The snapping movement can create even more inflammation and swelling (i.e. stenosing tenosynovitis), which produces further narrowing. This vicious cycle results in a stuck or locked finger, which makes movement increasingly difficult and painful (1).

2. Conditions in the workplace – a basis for preventive measures

Primary or idiopathic stenosing tenosynovitis is the most common type and is most often connected with work involving repetitive movements and movements requiring a strong grip of the hand (working with scissors or other hand tools (1,3). Inflammation is mild. With secondary tenosynovitis, inflammation is severe and is connected with systemic inflammation, gout, diabetes and renal failure (5).

3. Early treatment and rehabilitation

A feeling of discomfort or pain may be felt at the base of the thumb or fingers. Patients can report a snapping sensation or trapped finger during the grasping and releasing of the hand, which is sometimes visible. There may be pain and swelling in the palm area. A nodule in the affected tendon may be felt (palpated) and is usually tender. The first phase of treatment often includes a splint and anti-inflammatory drugs to reduce swelling. Individuals are advised to avoid activities that irritate the affected area. Spontaneous recovery is possible, but in the cases corticosteroid injection into the tendon sheath is needed. In 50% of cases, this treatment is successful after one or two injections. If conservative treatment is not successful, surgery is recommended to open the tunnel area and allow freer movement of the tendon. Physical therapy is sometimes recommended following surgery to restore normal hand movement. The underlying disease which causes inflammation may lead to chronic or recurring problems (1).

4. Staying physically active

The goal of rehabilitation is to reduce pain and inflammation. When the problem occurs, a quick diagnostic procedure and treatment are needed. Rest is advised only in the early stage, while guided physical therapy and daily exercise at home are recommended later on (4). The possible underlying cause of the inflammation needs to be diagnosed, movement and strength need to be restored and the recurrence of the disease must be prevented. Rehabilitation depends on the severity, duration and treatment of the disease (i.e. operative or non-operative). Mild symptoms may improve with rest, and modalities such as cold or heat may be used with individuals with moderate to severe symptoms to help with inflammation and discomfort. Hand exercises intensify based on the treatment's success. Treatment complications may occur with systemic inflammation, osteoarthritis and injuries. The disease can reoccur on the same or more commonly on the other tendon of the hand. In jobs requiring the use of both hands, the worker must be temporarily reassigned – if possible – to another workplace after rehabilitation until his condition improves. After surgery, the driving of motor vehicles is restricted for one week or more (1, 3).

5. Psychosocial factors and their impact on returning to work

If the dominant hand is affected, the condition may interfere with work tasks, such as writing. The individual must temporarily or permanently cease any activities that may aggravate their condition, such as repetitive movement. The

period of temporary inability to work depends on the method of treatment and the nature of the work. The period of temporary inability can be up to six weeks after nonsurgical treatment or longer after surgical treatment. Psychosocial factors are relevant to returning to work. The tendon gliding problems that occur with trigger finger do not encourage the tendency to simulate the symptoms (1, 3).

6. Promoting good muscle health

The most effective preventive measures in the workplace are ergonomic adjustments and decreasing repetitive movements of the hand and fingers. A worker who complains of such problems must be heard and advised about the performance of their work tasks. Good cooperation between the employer, the occupational safety expert and the occupational medicine specialist is helpful in detecting early symptoms, as the specialist can offer advice about workplace adjustments (1, 5).

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Finger exercises for an active break in the workplace

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All exercises are designed in a way that makes it possible to perform them during an active break at work. Adjust the number of repetitions for each exercise according to your physical capacity.

Exercise 1

The exercise is performed while sitting. Rest your elbow on a table and place your wrist and fingers flat on its surface. Make a fist, wrapping your thumb across your fingers. Release and spread your fingers. Repeat several times. You can perform this exercise with both hands at the same time or by alternating them.

Exercise 2

You can perform this exercise while sitting or standing. Place your hand flat on a table. Spread your fingers apart and then bring them back together. You can perform this exercise with both hands at the same time or by alternating them.

Exercise 3

You can perform this exercise while sitting or standing. Place your hand flat on a table. Lift each finger separately. Repeat several times with each hand

Additional exercise

To do this exercise, you need a small elastic band. The exercise is performed while sitting. Place your forearm on a table. Put an elastic band around your fingers. Spread your fingers as wide as you can and hold for a couple of seconds. Repeat the exercise with the other hand.

HIP PAIN

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1. Identifying the problem

The hip is the joint that links the torso and the lower limb. Its primary function is to support the weight of the body in both static (e.g. standing) and dynamic (e.g. walking or running) postures. The three most common causes of hip pain are arthrosis, fracture and tendinitis, the latter usually being the result of sports injuries to the hip area. Fractures most often occur in the femoral neck area and the number of cases is growing. Approximately one out of 205 people will suffer a femoral neck fracture and approximately 80% of all such cases are among persons over 60 years of age, postmenopausal women being the most exposed group (1). Hip degenerative arthrosis is also not rare, most often occurring with osteoarthritis. Statistics suggest that nearly every tenth person over 45 years of age will suffer from hip osteoarthritis. It affects more men than women under the age of 50, while the latter are more at risk after 50 (2).

2. Conditions in the workplace – a basis for preventive measures

Femoral neck fracture can occur with a little force putting pressure on a degenerated osteoporotically altered hip joint or with healthy ossein as a result of great force, such as a car accident or a fall from height (1). Other femoral neck fracture risks include diabetes, rheumatoid arthritis, bone metastasis and lack of physical activity as well as certain sports activities, such as long-distance running. Workers working at heights (risk of falling) and in the field, along with professional drivers are among the higher risk groups. Ballet dancers and soldiers can also sustain femoral neck fractures, the reason being stress fracture as a result of overload. The exact mechanism of injury remains unknown (3).

The most important risk factor for the development of work-related hip osteoarthritis is hard physical labour (especially load lifting). It can occur in mostly standing jobs and tasks that require a lot of walking (particularly up and down

a ladder or stairs), such as farming, mining, construction, firefighting, food production, the cleaning industry and, equally, in healthcare (4).

3. Early treatment and rehabilitation

Symptoms that indicate a femoral neck fracture are pain in the hip, groin or thigh area immediately after the event that led to the fracture, sometimes accompanied by referred pain in the knee. The treatment is surgical and urgent as the consequences of a fracture can be life-threatening (3). Based on the extent of the injury or the fracture level, surgeons either use screws and/or plates or perform an arthroplasty (the implantation of an artificial joint), which can be partial or total. Full postoperative recovery is seen in two thirds of cases, the most important factor being age (1).

Signs of hip osteoarthritis are pain and limited joint mobility. Treatment starts with painkillers and physiotherapy. If this is insufficient, the treatment continues with intra-articular injections (injecting corticosteroid in the problematic hip joint), osteotomy (surgical bone cutting) or arthroplasty (2).

4. Staying physically active

It is vital to stay physically active after femoral neck fracture. It is recommended to be physically active as soon as possible in order to prevent complications (deep vein thrombosis, pulmonary embolism, bedsores and pneumonia). People will usually return to work in just 1 to 4 months after surgery. The process of returning to work depends on the type of work. If a person works in a seated position, their sick leave will last up to 7 weeks when their work involves light physical activity, and up to 16 weeks when their work involves intermediate physical activity. In the event of total hip arthroplasty due to femoral neck fracture, the sick leave can last even longer and the return to work is possible only after making sure that there were no complications, such as avascular necrosis of the femoral head (death of the bone tissue due to lack of blood supply). Workers should not lift anything heavier than 20kg for at least a year after femoral neck fracture. People who work predominantly in a standing position should be temporarily assigned to another post where they can work in a seated position (3). It would be reasonable to adjust the workplace for workers who need to use devices such as crutches, rollators and walkers after femoral neck fracture. The distance that they need to walk at work should be shortened, their work position should be as close as possible to the entrance or the exit and there should not be any thresholds or other obstacles on the floor.

Approximately 20% of workers diagnosed with hip osteoarthritis can continue to work, whereas 6% of them need adjustments or limitations in terms of lifting heavy objects and reduced working hours. About two thirds of workers return to work after successful surgery. The pain due to hip osteoarthritis not only impedes activities directly involving the hip joint, but it can also affect sleep. Furthermore, it can affect activities that demand great concentration and attention (5). Considering the established correlation of hip osteoarthritis with muscle atrophy and muscular imbalance, physical activity is necessary to provide joint stability, reduce pain and improve function. Cycling is therefore recommended in the case of mild osteoarthritis.

5. Psychosocial factors and their impact on returning to work

In the case of femoral neck fracture, psychosocial factors that have an impact on returning to work have not yet been explored. It is described that marriage or partnership have positive effects on the process, while sadness or depression have negative effects. Psychosocial factors that have an impact on returning to work are more thoroughly explored in the case of hip osteoarthritis. The following are favourable factors: young age, living in a multi-person household, high personal income, good physical condition, few underlying conditions and high work-motivation (5).

6. Promoting good muscle health

Good muscle health is of vital importance for the hip joint and the person's general health. The recommended exercises are for example lunges, side squat walk with a resistance band, lifting the hip on a bench, small bridges with hip abduction using a resistance band, moderate jumps and moderate running.

The workspace should be planned with as few obstacles as possible (thresholds or high stairs).

Health promotion in the workplace can also be crucial for hip osteoarthritis.

Lifting aids should be used instead of manual load lifting. Workers need to be taught how to properly lift loads, including with the help of co-workers. A healthy lifestyle, including exercises, reducing overweight and maintaining appropriate body weight, is a prerequisite for a healthy hip joint.

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Hip exercises for an active break at the workplace

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All the exercises can be performed from a seated or a standing position and no accessories are needed (apart from basic office equipment such as a chair, a wall and steps). **Choose a solid, stable chair that doesn't have wheels.** The number of repetitions can vary according to your capacities and the time available.

Exercise 1

Start by seating down and holding the sides of a chair. Extend your knees and do the scissors exercise. Perform the exercise for 30 seconds.

Exercise 2

Start by standing up and placing your hands on a chair or a table. Alternate between extending your leg backways and sideways. The movement occurs at the hip, your upper body should stay still. Perform the exercise for 20 seconds with each leg.

Exercise 3

Start by taking a big step backwards with one leg. Place both hands on the front knee, while the other knee stays extended. Press the hip forwards and downwards, and straighten your lower back. You will feel a stretch through your front thigh and the hip of the extended leg. Hold for 10 seconds, then release. Repeat with your other leg.

KNEE PAIN

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1. Identifying the problem

The knee joint is one of the large lower limb joints and, together with the hip, it bears the most load in the human body. It connects the femur, the upper surface of the tibia and the patella, which are surrounded by a joint capsule with external and internal reinforcements (collateral ligaments). The joint itself also contains two small cruciate ligaments. The ligaments provide stability to the knee. Two crescent-shaped menisci, which protect the articular cartilage from excessive loads (they act as shock absorbers), are located between the femur and the tibia. Osteoarthritis, inflammation and joint injury are the most common causes of knee pain. Pain also results from inflammation of the tendons, tendon sheaths and muscles, often because of excessive and repetitive strain on the knee. The pain is frequently referred from the spine or hip.

2. Conditions at the workplace – a basis for preventive measures

There is a direct causal link between occupational risk factors and the development of osteoarthritis. Workers who repetitively squat, bend, kneel and lift loads are particularly exposed to osteoarthritis of the knee joint. Obesity, some high-level sports activities and a history of knee injuries pose an additional risk. However, the occurrence of injuries and osteoarthritis can be prevented or reduced by creating a suitable workspace (for example clean and dry floors, non-slip surfaces, no unnecessary obstacles and marked paths). Workers must also be provided with appropriate work equipment (for example protective footwear and knee pads) (1).

3. Early treatment and rehabilitation

The treatment of knee pain depends on its cause and must be adapted to the patient's age, activity, occupation, workplace and the underlying health condition. The early treatment of knee osteoarthritis includes reducing excessive

joint loads by adapting activities and reducing body weight. Physiotherapy is also very beneficial in the beginning, and pain can be relieved with pain relief medications and intra-articular injections (blockades). However, a knee endoprosthesis implantation is required in very advanced stages. Overload syndrome treatment is not significantly different from the treatment of arthrosis (2).

4. Staying physically active

Knee pain cannot always be prevented, but it can be alleviated by taking certain measures. General measures include maintaining appropriate body weight, avoiding long-term static pressure on the knee and excessive kneeling, squatting and walking uphill or on uneven terrain. In case of arthrosis, it is also recommended to wear appropriate footwear (with thick soft soles and elastic heels), to walk with trekking poles or crutches in order to relieve the knees, and to adapt and/or change the workplace. The pain caused by injuries and overload syndromes is best relieved by resting and staying still. In soft tissue injuries, rest should be short in order to avoid complications due to prolonged inactivity. In overload syndromes, however, physical activity should be suspended until the pain has completely disappeared. This should be followed by active exercises for increasing the blood flow, and later by exercises for strengthening the injured body part (2, 3). Exercises are performed with both legs, but the focus is on the weaker leg. The beneficial effects of regular exercise only appear after a month or later (2).

5. Psychosocial factors and their impact on returning to work

Chronic knee pain due to osteoarthritis is very common among the working population over the age of 50, and results in frequent sick leave and reduced productivity. These workers have to decide whether they will keep their health problems secret and continue to work without making specific adjustments to their workplace or whether they will reveal the severity of their pain and risk losing their job. Co-workers and superiors frequently do not understand the problems, and ergonomic workplace arrangements are rare (4). Returning to work after a knee injury depends on several sociodemographic and work-related aspects. Women, low-income workers and workers with physically demanding jobs are less likely to return to work (5).

6. Promoting good muscle health

In osteoarthritis and overload, knee pain can be prevented by regularly exercising all thigh muscles and, at the same time, by maintaining knee mobility. This helps preserve good muscle strength and enables the muscles to carry a part of the joint load. However, the first ergonomic measure for prevention of the knee pain in the workplace is avoidance of squatting and kneeling.

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Knee exercises for an active break in the workplace

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All the exercises can be performed from a seated or a standing position and no accessories are needed (apart from basic office equipment such as a chair, a wall and steps). **Choose a solid, stable chair that doesn't have wheels.** The number of repetitions can vary according to your capacities and the time available.

Exercise 1

Start by standing against a wall, with your feet at shoulder-width and 20cm from the wall. Slowly slide down the wall until your knees and hips are at a 90-degree angle, and hold for 20 seconds.

Exercise 2

Start by sitting down and crossing your arms on your chest. Stand up and sit down again. By using chairs of various heights you can adjust the difficulty of the exercise. Repeat 20 times.

Exercise 3

Start by standing up and placing your hands on a chair for support. Bend the knee and touch your ankle. The knee of the standing leg should not be "locked". Pull your ankle towards your bottom and tilt your pelvis forward so that the knee is facing the floor. You will feel a stretch through your front thigh. Hold for 10 seconds and repeat with the other leg.

ANKLE PAIN

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1. Identifying the problem

Because the ankle carries the entire body weight, it is prone to degenerative changes in case of injuries and, in particular, in case of multiple sprains. Statistics reveal that every tenth injury in the workplace is a foot and ankle injury. As every fourth or fifth person suffers from ankle pain, early identification, intervention and rehabilitation are necessary (1).

2. Conditions at the workplace – a basis for preventive measures

In order to prevent ankle problems, it is crucial to avoid slips and falls in the workplace, to remove slippery substances, and to ensure good visibility and lighting, in particular on staircases. Workers must be careful when walking, especially when carrying loads. Staircases should include handrails and landings. A safety fence should be provided for work at height. A worker should have at least 3 limbs in contact with the staircase and safety rails when working on staircases or ladders (2). The centre of gravity should follow the footprint.

3. Early treatment and rehabilitation

If possible, the goal is to return the worker to their pre-injury state.

In the case of ankle sprain, rest, cooling, compression and elevation of the limb are advised for the first 48 hours. It is recommended to gradually put weight on the ankle and to perform exercises for strengthening the ankle muscles. Most workers can return to seated work after 1 or 2 weeks, whereas manual workers can return to work after 1 or 2 months.

In the case of conservative fracture treatment, the area is immobilised for several weeks, until the bone starts to grow back. In the case of surgery, there

is no immobilisation and the patient learns to walk by shifting the weight to the uninjured foot and afterwards by putting gradual weight on the ankle. The weight the patient puts on the ankle depends on the phase of bone healing. The process of returning to work can take 3 to 6 months and, especially in the beginning of the treatment, it is necessary to take into account the worker's safety and the reduction of their work ability.

Degenerative changes of the ankle are expressed by persistent pain, swelling and rigidity of the joint in the first two years. Weight loss, pain relief treatment and physiotherapy are of utmost importance. In very advanced stages, surgical treatment is required, while in the final stage of joint arthrosis, joint fusion is necessary. After the fusion, the patient should not put weight on the fused ankle for 2 to 6 weeks. The majority of patients experience problems on uneven terrain and 60% of them have problems with prolonged standing or walking. Working with ladders is possible, if the operation is successful (3).

4. Staying physically active

Specialists in relevant fields, the workers' social network, their employers and the workers themselves need to work together so that workers perceive pain as manageable and harmless, with no stigma attached to it. If ankle pain persists for a long time, it is necessary to consult an orthopaedic specialist. The recommended treatment includes rest, but this does not necessarily entail prolonged absence from work. The pain does not need to entirely disappear before the worker returns to work. It is wrong to believe that work is dangerous because of the pain. The focus must be on what the worker is able to do. For the worker's complete rehabilitation, it is crucial to adjust their work and workspace. The worker must be offered flexibility (4).

5. Psychosocial factors and their impact on returning to work

Psychosocial factors have an impact on the successful return to work. The individual factors include: personality, perfectionism, mental and behavioural disorders (depression, anxiety, psychotic diseases), the person's notions of health and pain, and tendency to somatise. The workplace factors include: work demands, excessive or insufficient workload, the worker's autonomy, their scope for influencing the work methods, monotonous or repetitive work, work satisfaction and workplace relationships (5).

6. Promoting good muscle health

It is important to strengthen the ankle muscles and to properly treat sprains at a young age. The thick soft sole shoes with the rubbery heels protect the joints during work.

There are patients who suffer from chronic pain. The holistic pain therapy is suitable for such patients (5).

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Ankle and foot exercises for an active break in the workplace

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All the exercises can be performed from a seated or a standing position and no accessories are needed (apart from basic office equipment such as a chair, a wall and steps). **Choose a solid, stable chair that doesn't have wheels.** The number of repetitions can vary according to your capacities and the time available.

Exercise 1

Start by standing up and placing your hands on a chair for support. Stand on your toes, hold for a while and then return to the starting position. Repeat 10 times.

Exercise 2

Start by standing up and leaning against a wall, with your knees slightly bent. Raise the front part of your feet and your toes. You will feel the muscles of the front part of the tibia. Repeat 10 times.

Exercise 3

Start by standing up, with your heels over the edge of a step. If necessary, hold onto something for support. Use the weight of your body to press your feet downwards and feel a stretch through the back of your shin muscles. Repeat 10 times.

HEEL PAIN (ACHILLES TENDON)

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1. Identifying the problem

Achilles tendinitis is one of the most common ankle and foot injuries. It is mostly due to overload (resulting in pulled Achilles tendon), but also to improper footwear. It most commonly affects the middle-aged active population, in particular manual workers who perform repetitive moves and tasks such as climbing and descending stairs and walking on flat surfaces (1, 2). While the incidence of work-related Achilles tendinitis is not known, the incidence rate among recreational runners is 5.6%. The complete tearing (rupture) of the Achilles tendon is most common in men aged between 30 and 50. Due to the poor blood circulation in the area, it usually occurs from 4 to 6 centimetres above the Achilles tendon insertion (1, 3).

2. Conditions at the workplace – a basis for preventive measures

It is estimated that 30% to 50% of workers work on their feet (walking and/or standing work) for more than 4 hours per day. Most of these workers are employed in the processing industry (for example production workers and machine operators), hospitality industry, animal care, postal activities, healthcare, gambling activities, large laundry services and so forth.

Standing work mainly affects blood circulation and muscle tension in the lower limbs. Achilles tendinitis is the most common disease related to standing work. According to estimates, 1 out of 10,000 people suffers an ankle injury each day (1, 2).

3. Early treatment and rehabilitation

Most patients with Achilles tendinitis report swelling and pain above the heel, at the tendon insertion or in the calves, and lumps along the tendon. The insertion area is often thickened and tender. Tendinitis is usually treated with rest (foot elevation), compression (with bandages), cooling and pain relief medicines.

Achilles tendon rupture is treated surgically or non-surgically, which is followed by rehabilitation. Surgical correction quickly leads to a favourable outcome and the worker is able to return to work faster. Non-surgical treatment involves rest and wearing a splint or a cast until recovery (1).

Rehabilitation is based on alleviating pain and inflammation, enhancing ankle flexibility with stretching and strengthening exercises, and detecting and correcting potential biomechanical abnormalities of the lower limb. Soft shoe insoles are advised to reduce pressure on the Achilles tendon (2, 3).

Rehabilitation following an Achilles tendon rupture is focused on restoring endurance, proprioception, strength, full ankle mobility and normal gait pattern. To prevent over-activity of the calf muscles and to enable the tendon to heal, shoes with heel height of about 2.5 centimetres are advised until complete recovery (3).

4. Staying physically active

A person with chronic tendinitis needs to be assigned to a post that requires no lifting, load caring and climbing, but includes walking short distances and short standing periods. The same applies to Achilles tendon rupture where the use of crutches is advised until complete recovery. Furthermore, driving and climbing stairs are not recommended. Rest breaks should be more frequent. If a splint is prescribed, the patient can temporarily do seated work (4). It should be ensured that work footwear is suitable.

5. Psychosocial factors and their impact on returning to work

Employers, occupational medicine specialists, personal physicians, professionals in charge of safety at work, the personnel service and the health promotion team need to provide appropriate support to workers to help them return to work. Work demands should be gradually increased. Workers should be included in the work environment and informed about the organizational changes that took place during their absence (5).

6. Promoting good muscle health

Several measures are advised. Seated and standing work that lasts more than 4 hours needs to be adjusted for the use of a support chair. Workers can alternate between different positions. They can work in a seated or a standing position or in a relaxed position by placing one foot in front of the other. It should be possible to adjust the desk or bench height. The floor needs to be

covered with carpets and/or anti-slip floor coverings. Standing job positions require appropriate space for the feet that should be: 150mm deep, 150mm high and 500mm wide (4). It is strongly advised to lose weight. The working environment should be adapted for pregnant women and the size of their abdomen or they should be assigned to another post. They can perform up to 2 hours of uninterrupted seated and standing work. Appropriate footwear helps relieve pressure, support the foot arch and eliminate the difference in leg length (4).

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FOOT PAIN

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1. Identifying the problem

Foot pain is an unpleasant sensory and emotional experience following perceived damage to any tissue distal to the tibia or fibula. It affects one third of the adult population. Foot pain causes lower mobility, reduced leg strength and higher risk of falls (1).

There are numerous causes of foot pain, but it commonly affects women and increases with age. One of the major causes is poor footwear, in particular shoes that are too small and do not provide adequate support and structure such as high-heeled shoes, sandals or flip-flops (2). Tendonitis, stress fracture, corns and calluses are often due to the increased mechanical stress that occurs after short exposure to high magnitude stress, long exposure to low magnitude stress or a repetitive moderate-magnitude stress. Disabling foot pain typically occurs in connection with pain in other areas, such as hip or leg pain and spine or shoulder pain. It is more common in patients who have been previously diagnosed with arthritis, diabetes and/or stroke (1).

2. Conditions at the workplace – a basis for preventive measures

Numerous factors contribute to the risk of foot pain. Prolonged standing work is a major factor. The use of floor coverings, shoe insoles, compression socks and ergonomic workplace arrangement for both seated and standing work are recommended to reduce the adverse effects of standing work. Proper protective work footwear is needed, in particular in jobs that involve long-term standing work and walking on hard surfaces. Footwear influences gait patterns, foot pressure distribution, joint movements and force distribution. While walking, the pressure on the heel when it touches the ground is about double the body weight. The force placed through the heel is higher when a person walks on hard surfaces. Ergonomic footwear induces your torso to lean backwards and thus prevents spine pain (3). Compared to ergonomic footwear, non-ergonomic footwear increases the inclination angle of the torso and the hip, and increases foot pressure. Ergonomic footwear is padded around the toes and heel, and is available for different foot widths.

3. Early treatment and rehabilitation

A clinical examination is the first step in diagnosing foot disorders. It is crucial to examine the foot when no weight is being put on it and when it carries the load of the body, to analyse gait patterns and to study the connection of knees, hips and spine while a patient is walking. A foot X-ray helps to detect bone and joint disorders, while functional imaging provides information on the function of the foot's arches and tendons. An ultrasound examination is used to detect inflammation or injuries in tendons, joints and ligaments. A computed tomography scan is the best diagnostic examination, while magnetic resonance imaging has become indispensable for planning surgery and the post-operative follow-up (4).

Rehabilitation depends on the primary cause of foot pain. Conservative treatment includes a combination of physical therapy and the use of better-fitting footwear or orthotic devices (arch support pads in metatarsalgia, support for the outer part of the arch-stone in plantar fasciitis, additional pads in hallux valgus). If an operation is needed, absence from work is long-term. The period of inability to work depends on the primary diagnosis, the method of treatment and the type of work. In case of metatarsalgia, the period of inability to do heavy manual work lasts for 3 to 7 weeks, whereas in the case of major operations, such as hallux valgus surgery, the optimal period of inability to do heavy manual work is up to 12 weeks (5).

4. Staying physically active

A complete inability to work is limited to the early phase of the disease, when the focus is on the pain, inflammation and recovery after the operation. After alleviating the problems in the acute phase, the worker can gradually return to work. If a job involves predominately standing work or continuous walking, it is necessary to temporarily limit the standing work, squats and walking (5).

5. Psychosocial factors and their impact on returning to work

The biopsychosocial model describes foot pain as an interaction between biological, psychological and sociological factors. It includes somatic nociceptive stimulus, beliefs about pain, control strategies, mood, social and cultural environment, and personal expectations (2). The demands of work, the organizational climate and the job satisfaction are the factors that influence return to work.

6. Promoting good muscle health

The high prevalence of incorrectly fitted footwear suggests that greater emphasis should be placed on educating people about appropriate footwear. In this way they will become more aware of their feet dimensions and the right shoe size. Employers should provide workers with a wider range of occupational and protective footwear, including different widths for each shoe size.

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RHEUMATIC DISEASES

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1. Identifying the problem

Rheumatic diseases are among the most prevalent chronic diseases of the musculoskeletal system and the connective tissue, and they can affect a wide range of age groups. Since rheumatic diseases often lead to various types of functional disabilities, patients need to be under constant medical supervision. There are more than 150 rheumatic diseases that can be divided into two major groups: inflammatory and non-inflammatory rheumatic diseases. According to estimates, about 5% of the population suffer from a chronic inflammatory rheumatic disease (1). They typically affect one joint (arthritis) or multiple joints (polyarthritis). The inflammation occurs in the synovial membrane and it then spreads to other parts of the joint.

Rheumatoid arthritis is a chronic systemic autoimmune disease that typically symmetrically affects the small joints of hands and feet, but may also involve any other part. It is the most common rheumatic disease in the developed world and it affects approximately 1% of the population. Women develop the disease 3 times more often than men (2, 3).

Ankylosing spondylitis is a type of chronic systemic inflammatory rheumatic disease, primarily affecting the spine and joints between the sacrum and the pelvis. The disease primarily occurs at the insertion of ligaments, tendons and tendon sheaths, initially causing inflammation and ultimately progressing to fibrosis. In the final stage, calcium accumulates in the connective tissue, resulting in calcification. The prevalence of the disease ranges between 0.1% and 1.4% globally, and it affects men 2 to 3 times more often than women (4).

Scleroderma is a rare chronic progressive disease of the connective tissue. Localised scleroderma affects the skin and the hypodermis, resulting in hardened and shiny skin, whereas systemic scleroderma not only affects the skin, but also the internal organs. The disease is 3 to 8 times more common in women than in men and patients develop the first symptoms between the ages of 30 and 40 (5).

2. Conditions at the workplace – a basis for preventive measures

Inflammatory rheumatic diseases are not generally due to the job that a patient holds. However, the symptoms can be exacerbated by a cold and damp working environment, forced posture and heavy lifting (5). Due to the progressive nature of the disease, rheumatic patients are frequently on sick leave, which represents a great economic and social burden.

3. Early treatment and rehabilitation

Inflammatory rheumatic diseases remain incurable even in modern times. Early diagnosis and intense treatment of inflamed joints and connective tissues are crucial for a positive prognosis. Medications for the treatment of inflammatory rheumatic diseases are usually nonsteroidal anti-inflammatory drugs and analgesics (symptomatic medications), glucocorticoids (anti-inflammatory action), and synthetic and biological disease-modifying antirheumatic drugs (3).

Physical medicine and rehabilitation are an important complement to the pharmacological treatment of rheumatic diseases. They include different forms of physiotherapy, such as kinesiotherapy (different exercises), hydrotherapy, thermotherapy, low-level laser therapy, electrotherapy, breathing exercises and work therapy. The use of splints that alleviate pain during the movement, relax the muscles and reduce the pressure on the joint capsule, is an integral part of the rehabilitation for patients with rheumatic diseases. It is important to start the rehabilitation as soon as possible to prevent deformations, shortening of tissues and muscle weakness. Work that involves fine motor skills can be challenging for patients whose hand joints are affected (5).

4. Staying physically active

The workplace should be ergonomically adapted for patients with rheumatoid arthritis. An appropriate workplace enables the patients to rest when they experience pain, fatigue or swelling, to avoid bending and lifting heavy loads, and to change position every 20 to 30 minutes (5). Seated work is more suitable for such workers. If ankylosing spondylitis results in spine deformity, heavy work is no longer possible and patients need to choose a profession that does not involve heavy physical work.

5. Psychosocial factors and their impact on returning to work

Psychological factors such as anxiety, depression and inability to cope with the disease are an important element in chronic diseases (1). During the early stages of rheumatoid arthritis, the inability to work is limited to shorter periods, but as the disease progresses, the inability becomes permanent. Studies show that 20% to 30% of patients become unable to work in the first 2 to 3 years of the disease. It is common in patients with ankylosing spondylitis that their functional capacities and the ability to work remain relatively satisfactory even though they experience fatigue and moderate pain. Since the symptoms of systemic scleroderma vary, workplace accommodation should be considered individually, taking into account the patient's needs. Because inflammatory rheumatic diseases usually lead to work restrictions, workers and their employers need to openly cooperate and trust each other to avoid conflict.

6. Promoting good muscle health

Rheumatic diseases are one of the major causes of inability to work and early retirement, and they have a great social and economic impact (1). Patients need to be encouraged to improve their health by regularly performing the recommended exercises.

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INFLAMMATION OF THE SYNOVIAL BURSA DUE TO PRESSURE

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1. Identifying the problem

The synovial bursae are viscous fluid-filled sacs that are located at sites where the skin, the muscles and the tendons glide over rigid structures. There are more than 150 of them and they are located around the joints. They reduce friction between the different parts of the body (1). The inflammation of bursae that is caused by constant and repeated pressure on the bursa is called bursitis. The clinical picture of acute bursitis includes swelling, pain and decreased mobility of the affected joint. Compared to acute bursitis, chronic bursitis is manifested by dull pain in the area of the affected bursa, associated in particular with certain movements.

According to studies, bursitis occurs in 3.2% of the population, 80% of which are men. The construction industry records the highest number of occupational bursitis (1).

2. Conditions at the workplace – a basis for preventive measures

Inflammation of bursae in the knee area (prepatellar bursitis) occurs in workers exposed to kneeling, stooping, squatting and crawling. It is more common among miners, floor manufacturers, homemakers, plumbers, construction workers, gardeners and roofers (2). It also occurs in professional athletes such as wrestlers and football players.

Inflammation of the bursa in the elbow area (olecranon bursitis) is caused by pressure on the bursa in the elbow. This occurs in particular when a bent elbow is leaning on a hard surface for a prolonged time. It is more common among miners, students, soldiers and plumbers (3).

Inflammation of the bursa in the shoulder area (subacromial bursitis) is triggered by repeated movements of the upper limb above shoulder level. Oc-

cupations where workers manually move loads above shoulder level are at highest risk. These include occupations in construction, agriculture, fisheries, meat processing and retail. It also occurs in professional athletes such as kayakers and handball players (4).

3. Early treatment and rehabilitation

Early treatment is mostly conservative and includes pharmacological therapy for pain relief. Rest, cooling, fluid aspiration, compression bandaging, physiotherapy and avoiding pain-inducing movements are advised in the initial phase. If problems persist, it is also possible to inject anti-inflammatory drugs into the bursa. If conservative therapy fails, surgery is needed (5).

4. Staying physically active

Workers with musculoskeletal disorders should be advised that rest is necessary in the early stage of the disease, but that, later on, gradual physical activity under the guidance of a specialist is needed for complete physical rehabilitation. Early movement of the joint decreases the possibility of the formation of growths within the joints, enables the normal flow of lymph and blood, allows collagen synthesis and maintains good muscle function around the joint (2). Workers should also be informed how to maintain regular physical activity and appropriate body weight. If the synovial bursitis is caused by the job demands, return to the same workplace is questionable.

5. Psychosocial factors and their impact on returning to work

Before returning to work, it is necessary to identify and examine the psychosocial factors that could affect the onset of musculoskeletal disorders. The following psychosocial factors should be addressed in workers with bursitis (4): excessive work requirements (e.g. reducing physical workload), lack of autonomy and control over the work process (e.g. the possibility of influencing the work schedule and the distribution of tasks during working hours), and monotonous and repetitive tasks (e.g. work organisation that enables job rotation).

6. Promoting good muscle health

The promotion of good muscle health requires measures which aim at the improvement of the workplace ergonomics, the work organisation and the work environment, and to encourage employees to take responsibility for their own

health. Musculoskeletal disorders can be prevented if the following ergonomic principles are observed: the accessibility of objects located outside the recommended working area of the upper limb (e.g. above the shoulders or below the knees), the use of soft surfaces or knee pads for crawling or kneeling, the restriction of frequent repetitive movements, the introduction of power tools instead of physical work, and the reduction of pressure by cushioning or rounding the edges of objects that the worker comes into direct contact with. Sufficient space should be provided for movement. For example, narrow spaces need to be large enough for crawling. Workers should rest their muscles during the workday. In static work, workers need active rest to move and stretch. In dynamic work, however, passive rest should be anticipated. It is ideal if workers can have a certain level of autonomy and control over their own pace of work (4).

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FIBROMYALGIA

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1. Identifying the problem

Fibromyalgia syndrome is a medical condition of unknown etiology and pathogenesis. It is characterized by a diffused musculoskeletal pain, tender points in the muscles and in tendon and ligament insertions, fatigue, poor sleep, lower pain threshold, and the onset of pain triggered by normal and painless stimuli. The type and severity of the symptoms vary from patient to patient. Although fibromyalgia affects your daily life, it is not progressive or life-threatening. According to epidemiological research, fibromyalgia affects 0.5%–5% of the population, with a female to male ratio of 3:1. Approximately 80% to 90% of patients are women between the ages of 20 and 60 (2). The prevalence of fibromyalgia in Slovenia is unknown (1).

2. Conditions at the workplace – a basis for preventive measures

The clear causal factor that triggers fibromyalgia syndrome is not known. However, there are some risk factors that increase the likelihood of its development. External factors include reactive psychiatric conditions, infections, hormonal changes, excessive physical exertion, prolonged and excessive ambient noise at night, skeletal injuries that do not heal well and also oscillatory damage to the cervical spine (1).

3. Early treatment and rehabilitation

Fibromyalgia is mostly not (definitively) curable. The patient needs to be educated about the nature of the disease, because it is important that he takes an active role in the treatment (1). Diagnosis is made on the basis of clinical examination findings (which are atypical) and medical history (2). Targeted laboratory tests and other diagnostic procedures should be done if there are reasonable grounds to believe that fibromyalgia syndrome is secondary. The 2016 revised diagnostic criteria of the American College of Rheumatology are used for diagnosing fibromyalgia and establishing its severity (1).

The main goal of the treatment is to relieve the patient's pain and also to manage the situation in their work and family environment. Effective treatment is not pharmacological, but interdisciplinary and individually tailored. The Soča University Rehabilitation Institute of the Republic of Slovenia runs an interdisciplinary rehabilitation programme for patients with chronic non-cancerous pain. The goal of the rehabilitation is to maintain function despite the chronic limitations that are inherent to fibromyalgia. Unsuccessful treatment can result from unwanted side effects of medication or the patients' behaviour, whereby they limit their daily personal or professional activities (2).

4. Staying physically active

The employment rate of patients with fibromyalgia varies geographically, ranging from 34% to 77% (3). According to the literature, the period of inability to work due to fibromyalgia is on average 55 days, but it can also last for more than a year. As patients experience pain, but their physical condition and diagnostic tests are normal, there is no objective medical criteria to anticipate the reduced ability to work or disability (2). It is important to recognise fibromyalgia as soon as possible.

Fibromyalgia cannot be prevented, but it can be identified on time. Specialists of occupational, traffic and sports medicine have an important role as they can recognise fibromyalgia patients in a preventive health examination and direct them to further interdisciplinary treatment.

5. Psychosocial factors and their impact on returning to work

Early treatment and an early return to work are particularly important for patients diagnosed with fibromyalgia. However, because of the long waiting times, it may take months or even years for the patient to receive appropriate therapy. Workers with fibromyalgia are often on long-term sick leave. The patient's personality traits, motivation, willingness to work, work values, and the support of management and colleagues are highly important. The work should be quickly adjusted so that patients maintain their ability to work and stay up-to-date with work activities.

6. Promoting good muscle health

In 2011, the European Network for Workplace Health Promotion launched a joint initiative, proposing a six-step action plan. Its goal was not only to help workers with chronic diseases, including fibromyalgia, return to work, but also to help employers retain their workers and improve overall health in the workforce (4).

In some European countries, such as Ireland, the return to work is an important goal of employers. They keep in touch with workers during their sick leave in order to encourage them to voluntarily return to work early (5). Slovenian legislation does not allow such an approach. In accordance with the Personal Data Protection Act (Official Gazette of the Republic of Slovenia, No 94/2007 (ZVOP-1-UPB1)), the employer is not entitled to be informed about the worker's diagnosis or the method of treatment. As the employer cannot participate in the process of returning to work, an occupational medicine specialist has an even more important role in the communication between the employer and the worker.

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EPIDEMIOLOGY OF MUSCULOSKELETAL DISORDERS IN THE WORKING-AGE POPULATION IN CROATIA

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In participation with the Croatian Health Insurance Fund, musculoskeletal disorders in the period from 2011 to 2018 were studied by analysing the duration of absence from work and the number of insured workers who were absent in this period. The 10th revision of the International Statistical Classification of Diseases and Related Health Problems (1) was used to classify the causes of absence from work, namely the disease codes M40–M54 (dorsopathies). The data on the duration of absence from work and the number of persons on sick leave was compared to the annual costs incurred in the same period. The results suggest an increase in the number of days of absence from work due to musculoskeletal disorders. In 2011, 50,124 insured persons were absent from work for 1,531,390 working days in total, whereas in 2018, 94,709 insured persons were absent from work for 2,558,331 working days in total (2).

In the three-year period from 2016 to 2018, the data for the group M40–M54 (dorsopathies) is as follows:

- in 2016, 54,009 insured persons were absent from work for 1,249,040 working days in total,
- in 2017, 61,425 insured persons were absent from work for 1,349,569 working days in total,
- in 2018, 68,455 insured persons were absent from work for 1,492,406 working days in total.

In 2018, a high number of other intervertebral disc disorders (M51.8) was recorded and 10,714 insured persons were absent from work for 510,015 working days in total. A high number of unclassified intervertebral disc disorders (M51.9) was also recorded and 16,073 insured persons were absent from work for 356,559 working days in total.

The expenditure associated with salary compensation for absence from work was also examined:

- in the period from 2016 to 2018, the highest expenditure was associated with lower back pain (M54.5). In 2016 salary compensations amounted to EUR 6,883,301, in 2017 the figures were similar and they amounted to EUR 6,816,019, whereas in 2018 they rose to EUR 7,475,510.
- In 2018, considerable expenditure was associated with other intervertebral disc disorders (EUR 4,485,793) and other unclassified dorsopathies under the code M53 (EUR 1,678,874).
- The most common diagnoses that lead to absence from work:
- in 2018, lower back pain (M54.5) was the leading diagnosis in the number of days of absence from work and the number of insured persons, with 36,183 insured persons absent from work for 605,667 working days in total.
- It was followed by lumbago with sciatica (lower back pain, M54.4), with 16,085 insured persons absent from work for 479,022 working days in total,
- and by back pain (M54.9), with 8,022 insured persons absent from work for 140,345 working days in total.

According to the Croatian National Classification of Economic Activities, absence from work in the period from 2016 to 2018 was highest in hospital activities. In 2018, these activities accounted for 80,427 working days of absence from work, followed by retail sale in non-specialised stores, other wholesale trade, general public administration, and construction of residential and non-residential buildings (2).

Timely and regular education of the working-age population is a prerequisite for the protection of musculoskeletal health (3). Considering the vulnerability of healthcare workers in hospitals (4, 5), a special course on the health protection of future professionals and their patients is organised for undergraduate students of medicine and nursing at the School of Medicine at the University of Zagreb. Since nursing students already work in healthcare, they can use knowledge of workplace ergonomics in their work. Furthermore, immediately before the sixth-year medical students start to work, they acquire knowledge of work-related musculoskeletal disorders that can be caused by inappropriate static and dynamic efforts in their and/or their patients future jobs. They are first taught to recognise and describe the work-related efforts in case reports, and then to write a standard work history consisting of the following data: profession, work, total years of service, the description of previous and current jobs, the list of implemented technical and organisational safety measures and personal protective equipment, the duration of sick leave and the expertise of the pension insurance and social services experts. Students

need to acquire knowledge about necessary rest and physical activity. Based on this knowledge, the students (future healthcare workers) can significantly help to reduce the number of healthcare workers suffering from musculoskeletal disorders or at least slow down the development of such disorders.

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OCCUPATIONAL MUSCULOSKELETAL DISORDERS IN CROATIA

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In accordance with the legislation of the Republic of Croatia, an occupational disease is classified as such when it is demonstrated that it results from exposure to risk factors in the workplace or/and in the work environment, and when the intensity and duration of the exposure are such that they affect the worker's health. An occupational disease is demonstrated by taking into account certain protocols (algorithms) of occupational medicine, such as work history, the link between the disease and exposure at work, the clinical picture of the impaired function and/or the morphology of the relevant organs or organic systems that are known to be caused by a particular exposure at work. Furthermore, it is necessary to confirm the impairment with diagnostic test results (1, 2). When an occupational disease is suspected, the recognition procedure is initiated at the Croatian Health Insurance Fund by submitting the "Occupational Disease Application Form". It is filled in by a general physician, after receiving the employer's report and the report of the occupational medicine specialist or the occupational and sports medicine specialist. The next step in the procedure is to enclose the relevant medical reports and documents to demonstrate the exposure in the workplace. At the request of the Croatian Health Insurance Fund, the recognition procedure is carried out by the occupational or occupational and sports medicine specialists from the Unit for Occupational Medicine at the Croatian Institute of Public Health (3).

The List of Occupational Diseases contains 57 codes to describe the diseases that can be classified as occupational. Four of them are associated with occupational musculoskeletal diseases. These are the diseases caused by vibrations transmitted to the arms and palms (disorders of peripheral blood vessels and nerves, bones, tendons, joints and the surrounding tissues), diseases caused by vibrations transmitted to the entire body (disorders of the intervertebral disc of the lumbar spine), overuse syndromes caused by cumulative trauma (repetitive movements, the use of force, non-physiological position, vibration, pressure), and meniscus bursitis and lesions following long-term work in a kneeling and squatting position (2).

All the recognized occupational diseases are held in the Register of Occupational Diseases kept by the Unit for Occupational Medicine at the Croatian Institute of Public Health. The data from the 2011–2018 period indicates that 1,745 occupational diseases were recognised and that 1,224 of them were occupational diseases caused by asbestos exposure. There were only 521 cases of other occupational diseases. In the same period, 275 occupational diseases under the codes 37.1, 37.2, 41 and 42 of the List of Occupational Diseases were recorded (classified as musculoskeletal disorders). The most common were diseases under code 41, which includes overuse syndromes caused by cumulative trauma. 171 of such cases were recorded and the trend is clearly rising. According to the data that the Croatian Health Insurance Fund collected for the period from 2011 to 2018, the highest number of days of absence from work is associated with diseases under code 41. The carpal tunnel syndrome (code G 56.0 under the 10th revision of the International Statistical Classification of Diseases and Related Health Problems) was the most common diagnosis recognised within the framework of occupational musculoskeletal diseases, occurring mostly in manufacturing industry (4).

Considering the growing proportion of musculoskeletal diseases among occupational diseases in Croatia, the focus must be put on disease prevention. The Croatian Institute of Public Health participates in the formal education of trainee specialists in occupational and sports medicine. Their future work will consist of visiting workplaces to help reduce the risks of musculoskeletal diseases. Furthermore, the Institute organises seminars for occupational safety experts, workers and employers, and educates the general public by publishing guidelines, guides, leaflets and catalogues (5). The major future challenges are early preventive activities during professional training, the education of doctors in other specialities, especially those who work in the diagnostics, treatment and rehabilitation of musculoskeletal diseases, as well as practical training in the workplace with the aim of health protection and the retention of workers in the workplace.

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ABOUT THE EUROPEAN CAMPAIGN HWC 2020-22: HEALTHY WORKPLACES LIGHTEN THE LOAD

Taken from the materials prepared by the European Agency for Safety and Health at Work

Eurostat data shows that 60% of all EU workers with work-related health problems report musculoskeletal disorders as their most serious health problem. According to the Sixth European Working Conditions Survey (Eurofound, 2015), three out of five workers in the EU-28 complain of musculoskeletal disorders. The workers' most common complaints include back problems and upper limb muscle pain. The first data from the Third European Survey of Enterprises on New and Emerging Risks (EU-OSHA, 2019) reveal that musculoskeletal disorders and psychosocial risks are the most common problems in European workplaces. Repetitive hand or arm movements (65%), sitting for prolonged periods of time (61%) and having to deal with difficult clients, patients, pupils and other customers (59%) are the most common risks reported by enterprises and organisations from the EU-27.

Work-related musculoskeletal disorders are among the most common causes of disability and absence from work, and represent a considerable cost to the individual, the company, the health and pension insurance fund and society as a whole. The prevention of work-related musculoskeletal disorders and the consequent improvement in workers' health and wellbeing have thus been among the priorities of all EU strategies on health and safety at work since 2002.

In light of the above, the European Agency for Safety and Health at Work has decided to relaunch its awareness campaign on work-related musculoskeletal disorders in the 2020–22 period.

It should be noted that the decision behind the campaign is additionally supported by the fact that many companies and organisations have introduced teleworking during the COVID-19 pandemic, as it was the only way to continue their operations. According to Eurofound Survey "Living, Working and COVID-19", more than a third of the active working population in the EU worked from home in April 2020. This form of work is often associated with poorer ergonomic design in the workplace, prolonged sitting, loneliness and irregular working hours, all of which contributes to the occurrence or deterioration of musculoskeletal disorders.

The European campaign HWC 2020-22: Healthy Workplaces Lighten the Load, ran in more than 30 European countries. Its aim was not only to raise awareness about work-related musculoskeletal disorders and their negative effects on individuals, businesses and society, but also to promote cooperation to adopt effective preventive measures to tackle musculoskeletal disorders.

Efforts to prevent and manage work-related musculoskeletal disorders continue.

Be active in your work environment!

Healthy Workplaces

LIGHTEN THE LOAD