

Department of Occupational Health, Safety and Environment
RSI prevention
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RSI: symptoms and working conditions

What is RSI?

RSI is an abbreviation for Repetitive Strain Injury. It is a collective term for muscle, tendon and nerve disorders of the neck, shoulders, upper back, arms, hands and fingers. Besides pain, there may also be some loss of strength, temperature variations, radiated pain and loss of function.

The symptoms often come on gradually and may go through several phases. At first, you may feel vague pain that comes on sometime during a working day and goes away after a break, but later you also have some discomfort in the evenings, and eventually the pain is continuous. Recovery is then usually a long process and the symptoms return readily. Sometimes the symptoms may even be chronic, resulting in permanent damage, pain and loss of function.

The onset of RSI symptoms is often insidious.

RSI may occur in a wide range of occupations, notably those that involve working at the computer, but frequent use of a pipette, lengthy sessions with a microscope, or standing at a conveyor belt are also implicated. Because the symptoms may lead to absence through sickness and leaving the workforce, it is important both for you and the employer to detect the symptoms at an early stage and to take specific corrective action. If you do so you will avoid many problems.

An example of dealing with working at the computer is given below.

How does RSI start?

RSI often starts through a combination of too much movement (always the same movements, which strain muscles and tendons) and too little movement (movement fatigue). This combination arises, for example, in long-term work at a computer or packaging tasks: arms and hands constantly repeat almost identical movements, while the neck and shoulders are almost stationary. If your posture is also fixed and tense, the muscles in your neck and shoulders tighten up, which hinders the circulation of blood in the muscles and the nerve paths, stimulating pain and tightening the muscles even more. In this way, you end up in a vicious circle. Furthermore, individual and job-specific factors play an important role in the onset, aggravation and prolongation of RSI.

Among the factors that influence the onset of RSI are

- Workstation: an ergonomically poor workstation, vibrating tools, poor lighting, draughts and fluctuating temperatures.
- Method of work: adopting bad postures and patterns of movement, such as working with hunched up shoulders, long periods working above shoulder height, squeezing objects between the thumb and forefinger and slumping in your chair.
- Pressure of work: load peaks, stress, being in a hurry and pushing yourself.
- Work duties: tasks that are too monotonous, too easy, or too difficult, or where you do not have enough freedom to organize the work for yourself.
- Working hours: taking too few breaks, or not being able to organize the work for yourself.

How can you prevent RSI?

Workstation

Make sure that your workstation is set up ergonomically, including the lighting and climate. It will help you relax if you can set up your workstation for yourself, with your own personal items.

Method of work

Make sure that you carry out your activities in the least taxing way possible, paying particular attention to your posture and pattern of movement.

Pressure of work

Avoid peaks in the pressure of work by anticipating predictable busy periods.

Whether a high pressure of work also causes stress depends very much on how you deal with your stress and on your personal drive.

Work duties

Your tasks must match your level of knowledge and experience. Ensure that your duties are well balanced, distributed evenly through the day and with sufficient opportunities to make adjustments. Alternate taxing activities with less demanding tasks.

Working hours

The number of hours in a working day and working week must not exceed your capacity. Make sure that you take regular and natural breaks in the activities. For example, take a 10- minute break from working at the computer every hour by doing something different, and change position every five minutes.

What can the Department of Occupational Health, Safety and Environment do for you?

Early detection of RSI symptoms and a structural approach to its causes make an important contribution to the prevention of RSI. The Department of Occupational Health, Safety and Environment is able to help you in the following ways:

- You can make an appointment with the medical officer to diagnose early RSI symptoms.
- You can make an appointment with the occupational health adviser for an individual investigation at your desk.
- You can ask for advice on solutions and measures for reducing or avoiding health risks.
- We can give you information, in consultation with your manager, on the causes and consequences of RSI.
- We can give you information on eye tests and the procedure to be followed to obtain VDU spectacles.

For additional information on RSI, visit:
www.rsipagina.nl

Working at the computer

Working at the computer is one of the activities in which RSI can start. The predisposing factors for RSI mentioned above occur in long-term and incorrectly performed work at the computer, and RSI, back problems and other locomotor system symptoms may appear. Reading from a screen generally takes more effort than reading from paper, and your eyes will tire more quickly. However, working at a computer screen will not cause your eyes to deteriorate. If you can no longer read the text on the screen properly, or if it is insufficiently sharp, the cause could be the distance to the screen, or natural deterioration of your eyes.

Layout of the workstation

The chair

Along with a good posture, it is important to have a good chair. Stability and adjustability are the most important requirements for an office chair.

This means that the chair must have a foot ring supported on at least five sets of wheels, and must allow adjustment of the seat height, arm and elbow rest height and width, backrest position and seat pan depth.

Guidelines for adjusting the chair

The seat height

You can determine the correct height by sitting upright in the chair as far to the back as possible. Adjust the height of the chair so that your feet just rest flat on the ground. The angle between your lower and upper leg will then be approximately 90 degrees.

The seat pan depth

If there is room for a fist between the front of the seat and the back of your knees, you know that your thighs have sufficient support. If not, slide the seat pan backwards or forwards until the depth is correct.

Backrest

Lumbar support is important, which means that the hollow part of your back must rest on the curved part of the backrest. Adjust the backrest height accordingly.

Armrests

Adjust the height of the armrests so that your elbows rest on them while you are working with your upper arms hanging relaxed and your lower arms horizontal. Avoid hunching your shoulders while sitting at the keyboard. The angle between your lower and upper arms should be 90 degrees with your hands on the keyboard.

Desk and desktop

The most important requirements are as follows:

- Sufficient leg room (65 cm deep and 60 cm wide);
- Non-reflective work surface;
- The table or desktop height should preferably be adjusted to the user's height. The most common fixed desktop height is 75 cm.

If the desktop is too high, adjust the height of your chair so that when your hands are on the keyboard, the angle between your lower and upper arms is 90 degrees. If necessary, use a footrest to ensure that the angle between your upper and lower legs is also approximately 90 degrees (see chair). If necessary, place blocks under a table that is too low.

The screen

Sit with the screen straight in front of you. The recommended viewing distance to a 17 inch screen is between 60 and 85 cms. Irritating reflections and light shining on the screen can be avoided by turning the monitor at right angles to the window, and preferably 2 metres away. Irritating reflections can also be avoided by tilting the screen slightly. The screen is at the correct height when its upper edge (where the glass meets the case) is approximately at eye level. If necessary, insert a pile of paper or a monitor support under your monitor. If you share a single workstation with other people, a continuously adjustable monitor support is advisable.

Keyboard and mouse

You should preferably use a symmetrical mouse, which can be used in both the left and right hands. The keyboard must be as flat and level as possible. Fold away the feet under the keyboard. The maximum thickness is 3 centimetres.

The mouse and the keyboard should be operated with your arm or arms at an angle of 90 degrees and with straight wrists. You should therefore position the mouse and keyboard within easy reach and operate them with your elbows supported, for example on the armrest. The movement for typing and using the mouse should be made from the elbow, and not from the wrist.

Document holder

If you work with documents regularly, you should preferably use a document holder that can be placed between the keyboard and the screen. This can avoid you having to strain your neck forward and look left or right to see a document.

Laptop

Because a laptop computer keyboard is fixed to the screen, either the keyboard will be too high, or the screen will be too low while you are working. You will therefore have to bend forward in an incorrect working posture. If you work for more than two hours a day at a laptop, a variety of ergonomic adjustments need to be made to the workstation to limit the risks to your health. You must use a separate mouse, a separate keyboard and either a laptop holder or a docking station.

Workstation at home

If you work at the computer at home for an average of 2 hours a day, the workstation must comply with the same ergonomic requirements as for the computer at work. The same applies to working hours, work duties, working posture and pressure of work.

Room and lighting

The lighting in your working environment deserves special attention. Lighting is the most common cause of tired eyes. You can become so accustomed to the glare of lighting and the sun on your screen that it does not occur to you that you can do something about it, for instance by installing special light units and a sun blind.

Method of work

- Sit up straight, and sit with your screen straight in front of you.
- Avoid a twisted or crooked working posture, which causes unbalanced muscle loading.
- Work with relaxed shoulders, and upper arms hanging down.
- Your hands should be in line with your lower arms. Avoid flexing your wrists, and while typing and using the mouse, move your hands from the elbow, not from the wrist.
- Change position regularly.
- Listen to your body.
- For exercises that will help the circulation in your back, neck, shoulders and arm muscles and to relax them, take a look at the website: www.vu.nl/arbo-en-milieu.

While your employer provides an ergonomic workstation, you as employee should take your own steps to ensure that you have a healthy workstation, a correctly adjusted chair and that you take a break from using the computer every hour.

Pressure of work

see RSI

Work duties

Make sure that your duties are well balanced, distributed evenly throughout the day and are sufficiently varied.

Working hours

Alternate working at the computer with other work for 10 minutes every hour. Break software is available to help limit uninterrupted computer-based work. There are a number of programs of this kind that record the number of keystrokes per minute. They may also keep track of the intensity of mouse movements and monitor the breaks you take. Work no longer than 6 hours a day at the computer.

This document is published by the Department of Occupational Health, Safety and Environment, the in-house occupational health and environmental service of the Vrije Universiteit and the VU University medical center. The service exists to promote improved working conditions and to reduce the impact on the environment of the VU and the VU University medical center. The service makes recommendations and provides implementation support, notably by helping reduce the level of absence through sickness through preventive and other measures. The service also provides training to in-house emergency and first-aid officers, draws up disaster plans and risk surveys and is involved in various activities including the collection of chemical and radioactive waste and permit applications (e.g. related to the environment and radiation). The Department of Occupational Health, Safety and Environment has numerous specialists on health, safety and the environment, including medical officers, safety experts, radiation experts, occupational health experts and environmental experts, who will be pleased to answer any questions you may have.

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Department of Occupational Health, Safety and Environment

Questionnaire on working at the computer

VU University medical center

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Amsterdam

INTRODUCTION

By completing this questionnaire, you will be able to form a view of any specific issues in your own work situation.

The questionnaire consists of five blocks:

Block 1: Work duties

Block 2: Working hours

Block 3: Pressure of work

Block 4: Workstation

Block 5: Method of work

You can answer the questions with a yes or a no, and sometimes with n/a. Each of your answers is associated with a certain number of points. The more points, the greater the burden. A points scale is given for each block, from which you can read off your total to see if you are in the critical area.

Green No problem

Yellow Problem, try to correct, especially if you have symptoms

Red Clear problem, always try to prevent

Before the 5 blocks there are several additional questions. These questions fall outside the categories mentioned above, and explore the background to your work situation and any symptoms you may have. Any recommendations and notes that accompany the questions are shown in italics.

If you have any questions, please contact the occupational health adviser on extension 49001, 49002 or 49024. If there is no answer on these numbers, please call extension 49008.

In producing this questionnaire, use was made of:

Handboek RSI, risico's, oplossingen, behandelingen,

3rd revised impression, K.J. Peerenboom and M.A. Huysmans.

ADDITIONAL QUESTIONS

How many hours a day do you spend at the computer while at work?

- less than 2 hours
- 2- 4 hours
- 4- 6 hours
- more than 6 hours

How many hours a day do you spend at the computer while at home (e-mail, games, Internet)

- none / never
- less than 2 hours
- 2- 4 hours
- 4- 6 hours

The risk of symptoms increases with the number of hours you spend at the computer in a day. It is inadvisable to work at your computer for more than 6 hours a day.

You carry out the following activities at the computer

- word processing
- data entry
- spreadsheets
- drawing
- programming
- Internet
- e-mail
- games
- other (please specify):

Do you often (more than once a week) suffer from: (more than one answer is possible)

Place

pain

tingling or numbness

work related

computer related

other

neck/shoulder

arm

wrist/fingers

back

legs

other

The five blocks mentioned above start here.

Do not forget to put a circle around 'green', 'yellow' 'or red' under the block concerned.

example:

1. question

2. question

Total

BLOCK 1: WORK DUTIES

1. My job involves only operational work (in other words, no planning, support, organization or monitoring is involved)
2. My job involves a combination of different tasks, some easy and some more difficult
3. I regularly alternate other, non-computer-based work with working at the computer, (such as meetings, photocopying and making phone calls)
4. I have some freedom to determine my own sequence and method of work
5. My work presents me with sufficient challenges
6. I am able to call in help in the event of technical and other problems so as to work around obstacles easily
7. I have sufficient opportunities for contact with colleagues
8. It is clear to me that the activities have been carried out 'well'

Total

Notes:

- Variation in movement and working posture is important in preventing RSI. This is often dictated by the tasks involved in the work.
- A task involving monotonous activities leads to an unbalanced loading of the body.
- An extremely easy or, conversely, extremely difficult task, or little feedback, can cause stress. Stress can lead to a high underlying muscle tension, in particular in the neck and shoulders.

BLOCK 2: WORKING HOURS

1. I regularly work for longer than 6 hours a day at the computer
2. I regularly work for longer than 4 hours a day at the computer
3. I use a laptop or notebook computer for more than 2 hours a day (without using a laptop stand, separate keyboard, separate mouse, or a separate monitor)
4. I am able to take a 10 minute break from working at the computer or do other work after no more than 2 hours
5. I am able to arrange for micro breaks or change to an alternative task during my work
6. I work overtime more than once a week on average (based on an 8- hour working day)

Total

Notes:

- The notes to Article 5.10 of the Working Conditions Decree say:
 - work on a VDU should be limited to a maximum of 5 or 6 hours a day
 - the work on a VDU should be alternated with other work or a break of at least 10 minutes after 2 hours
- Working with a notebook or laptop computer without measures such as a laptop holder causes a poor work posture. The Working Conditions Decree and the Working Conditions Order state that such work should be restricted to 2 hours a day.
- Taking micro breaks from the work stimulates the circulation of blood in the arms and neck, thereby helping recovery during the work. Using break software can help.
- Regular overtime may lead more quickly to work stress, which makes it a risk factor for the onset of RSI.

BLOCK 3: PRESSURE OF WORK

1. I regularly have to work under very high pressure or at a very fast pace (peaks)
2. I am regularly unable to finish my work
3. I am able to set my own pace of work
4. We work to a fixed daily or weekly production or we are allowed to go home when the work is finished
5. My work is regularly interrupted in an annoying way by colleagues, the telephone, etc.
6. I find the software convenient and efficient

Total

Notes:

- Research has shown that RSI related symptoms often coincide with a high pressure and a high pace of work. Deadlines, large peaks in the pressure of work, pressure to perform, poor support, etc., are increasingly coming to be seen as the most important risk factors for RSI.
- Regular interruptions by colleagues, the telephone, etc., take time and disrupt concentration, all of which increase the pressure of work.

BLOCK 4: WORKSTATION

Screen

1. My screen is straight in front of me
2. The top edge of my screen (where the glass meets the case) is approximately at eye level
3. The viewing distance between my eyes and the screen is correct

Screen size

14 inch

15 inch

17 inch

19 inch

21 inch

Recommended viewing distance

50 - 70 cm

55 - 75 cm

60 - 85 cm

70 - 95 cm

75 - 105 cm

4. My screen has relatively dark letters or lines on a light background
5. My (reading) glasses are considered suitable for working with a screen

Office chair

6. My office chair complies with the current legal ergonomic standard
7. My chair has been adjusted correctly to my measurements by myself or an expert
8. The armrests are well clear of my body (more than enough room for a fist between body and armrest)
9. My armrests get in the way when I move the chair close to the desk

Desk

10. The height of my desk is fixed or has been adjusted such that I am able to work with my shoulders hanging down and the angle between my lower and upper arms is approximately 90 degrees
11. I have (if desired) a stable, height adjustable footrest available
12. I have sufficient legroom under the desktop, so that my legs do not knock against anything when I sit down, move close to the desk and when I stand up
13. My desktop, including the supporting structure at the front, is thicker than 5 cm

Keyboard, mouse and accessories

14. My keyboard and mouse have a cable that is long enough to allow them to be placed and operated conveniently on the desk
15. The mouse moves freely and does not snag on my desktop
16. I have (if desired) a sufficiently large and stable document holder available
17. I regularly clasp the handset between my head and shoulder when I have to use the phone while working at the computer

Working environment

18. It is regularly unpleasantly cold or draughty at my desk
19. Reflections of lights, windows or light coloured walls appear in my screen
20. I look straight at the sky if I look into the distance over or past the screen
21. All the windows have effective, adjustable anti- glare devices that keep out the light effectively
22. There is regularly so much disturbing noise that I am unable to carry out my work properly (for example, I cannot make out what people say on the telephone)

BLOCK 5: METHOD OF WORK

1. As a computer user, I am given sufficient information on the correct method for working at the computer and the workstation
2. During my work, my arms rest on the correctly adjusted armrests of the chair or the desktop
3. While typing and using the mouse, my wrists are more or less straight
4. I change working position regularly
5. I have a relaxed work technique so that I avoid tension in my shoulders and fingers
6. I regularly perform stretching exercises to ensure good circulation in my shoulders and arms

Notes:

- The correct height of and distance to the **screen** are particularly important in being able to keep your neck in a neutral position. If you do not keep your head in a neutral position, the static muscle load will increase, especially in your neck and shoulders.
- It is important to adjust the **office chair** to the measurements of the individual employee in order to ensure the best possible support while seated.
- A **desktop** that is too high causes your shoulders to hunch up while working, which increases the muscle tension in your neck and shoulders.
- If you regularly type out text or data, the use of a **document holder** is strongly advisable, because it reduces the amount you have to twist your neck.
- People involuntarily tighten their shoulder muscles in **cold or draughty conditions**.
- **Noise** can cause irritation and stress. This causes a tense work posture, which increases the chances of developing RSI symptoms.
- **Reflections** in the screen often cause people to adopt a poor work posture. A correct positioning of the screen relative to a window or lights can often eliminate glare or reflections.
- Providing information to staff on using the computer in a healthy way is a mandatory occupational health measure, and it contributes to achieving a healthy work technique.
- Supporting your arms while you work reduces the static muscle load throughout your upper body, which is good for the circulation.
- Keeping your wrists straight (in both the horizontal and vertical direction) reduces the mechanical load when typing and using the mouse, which in turn reduces the risk of wrist disorders.
- Changing position while working is of great importance, as is alternating with stretching exercises to stimulate the circulation.