Mousetrapper®
the ergonomic mouse

Why do so many experience pain in their neck, shoulder and arm when working at the computer?

To work Centered

Whitepaper May 2020

To work Centered

More and more people are spending more and more time at work in front of the monitor, and there are signs that more than half feel pain in the arm, shoulder or neck[1]. It is often called Mouse Arm Syndrome, or RSI (Repetitive Strain Injury), as it is called by professionals. Mouse Arm arises when we perform small repetitive muscle movements for a long time. It is painful but usually it can be cured, however it can take a long time and in some cases it can become chronic.

The problem does not seem to diminish either. Today, children use tablets and computers from an early age, and the problem now also affects the young adults who have lived their entire lives on a screen. There is a major health problem that we need to deal with in order to reduce the damage.

Man has been on the earth for about 300,000 years. In about 299,850 of these years, their bodies were used to perform tasks such as hunting, cultivating land and growing crops. Our genes have been developed to keep us moving, but our everyday life has changed radically in the last 150 years. With the industrial community, we spend more and more time sitting at our workplaces. And since the 70s, the computer has become the most common tool.

What can we do to reduce the problem? What do we need to change in attitudes, behaviors and habits? And what technical, ergonomic tools can be important to avoid unnecessary problems?

If you look at what the workplace looks like for many of us, we spend a large part of the day in a chair at a desk – and today when many work remotely it can of course vary how we sit. In this Whitepaper we will not deal with the optimal sitting / standing position, more on that you can read about in “Three positions that make a difference”.

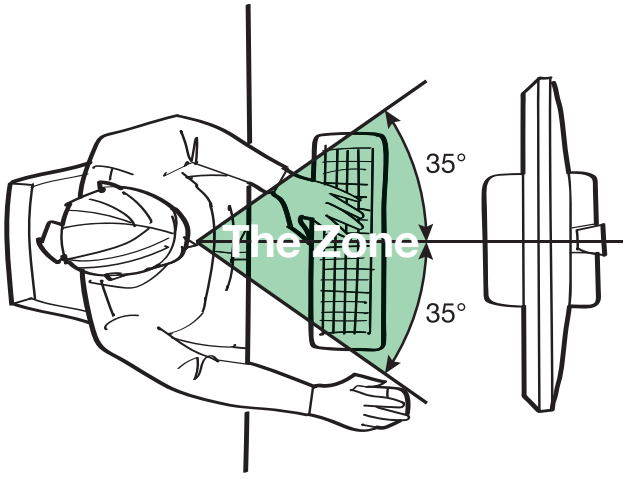
On the table in front of us we have our tools. There is often a monitor / laptop and keyboard in front of us and a mouse to the right (if you are right-handed).

We will now look at why this might not be optimal and what you can do about it.

In the studies that have been done, slightly different conclusions are drawn as to why this is so. In fact there was already a study in 1926[2] that showed unacceptable muscle tension in typewriter work, and we will now look at current relevant data.

It has been found that when working with hands and arms a bit from the body, tension in the muscles arises when they are constantly working in repetitive tasks and can’t relax. Then you run the risk of getting a so-called Mouse Arm, or RSI Repetitive strain injury[3], which can be described as work-related strain injuries in the neck, shoulders, arm and wrists.

It often starts with feeling pain in a certain movement and the area might swell up. If you do not treat it, you risk a long healing process – and in the worst case, it can become chronic.



What is recommended?

Most of the writing is about how to find a good position when sitting or standing at the computer. You can read more about it in “Three positions that make a difference”.

ISO (International Organization for Standardization) is an independent global organization that has studied the issue.

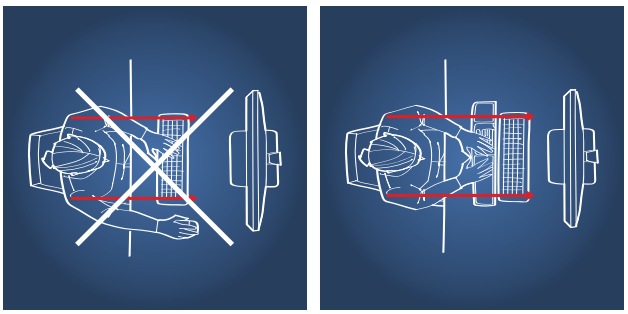
1 *Computer-related Pain. A survey of the Swedish people's experience of working at a monitor. KantarSIFO 2018.*

2 *Klockenberg EA. Rationalisierung der Schreibmaschine undihrer Bedienung [Rationalization of the typewriter and its operation]. 1926; Berlin: Springer.*

3 *The National Health Service, United Kingdom. https://www.nhs.uk/conditions/repetitive-strain-injury-rsi/*

ISO certification is available in a variety of areas and is a great way to agree on standards regarding similar issues all around the world. Their definition of good posture underlies ergonomic recommendations in many countries.

Their recommendation[4] is to strive to work within a "zone", about ±35 ° from an imaginary straight line "through the nose" (the vertical axis), see image. Simply put, try to work with the elbows inside the shoulders as far as possible. This is especially true of tasks that are common.



Working outside vs. Working inside the Zone. Strive to keep your elbows "inside" your shoulder.

The Keyboard

The keyboard should be positioned with the h key centered "in front of the nose", to facilitate a properly centered position. This way you get a relaxed posture and avoid moving outside the "zone".

Many keyboards have a numeric section to the right, and if your main task is punching numbers, then you have to adjust the position of the keyboard accordingly. It is also advisable to place the keyboard a bit into the table so that the arm and wrist can rest against the table. If you have a raised keyboard, it may be good to support the wrist. Otherwise, the trend is towards lower keyboards, and attempts are made to avoid forward tilt on the keyboard, which was previously considered advantageous, since the angle of the wrist is considered to be the cause of the problems.

The Mouse

For most people, the traditional mouse falls well outside the desired "zone". Therefore, more and more studies are showing that alternative mouse solutions are better to avoid RSI.

with different mouse positions[5]. The respondents were allowed to do different experiments when placing the mouse in different positions and measured the muscle activity in the forearm and shoulders. Their conclusion was that the centered mouse solution provided the most neutral position and unnatural positions were avoided in mouse-intensive tasks.

Other studies[6] point in the same direction; that the centered mouse solution had the greatest effect on reducing unwanted load compared to a traditional mouse. It is stated that the alternative mouse that most effectively reduces the biomechanical load on the shoulder and forearm is a mouse that is centrally located in front of the keyboard. There are several studies that proves this[7] – and if you use a numeric keyboard, the difference becomes noticeable when the mouse gets even further away from the "zone".

Summary

The recommendation, which is recurring in literature and reports, is about avoiding working outside the "zone". Keeping the elbows inside the shoulders is a good call if you want to avoid future problems in front of the computer with neck, shoulder, arm and wrist pain.

If you are already feeling pain, it is important to absorb current knowledge, both in terms of position, what ergonomic tools are available, and what exercises and behaviors contribute to good health.

For more information and solutions,
visit www.mousetrapper.com.

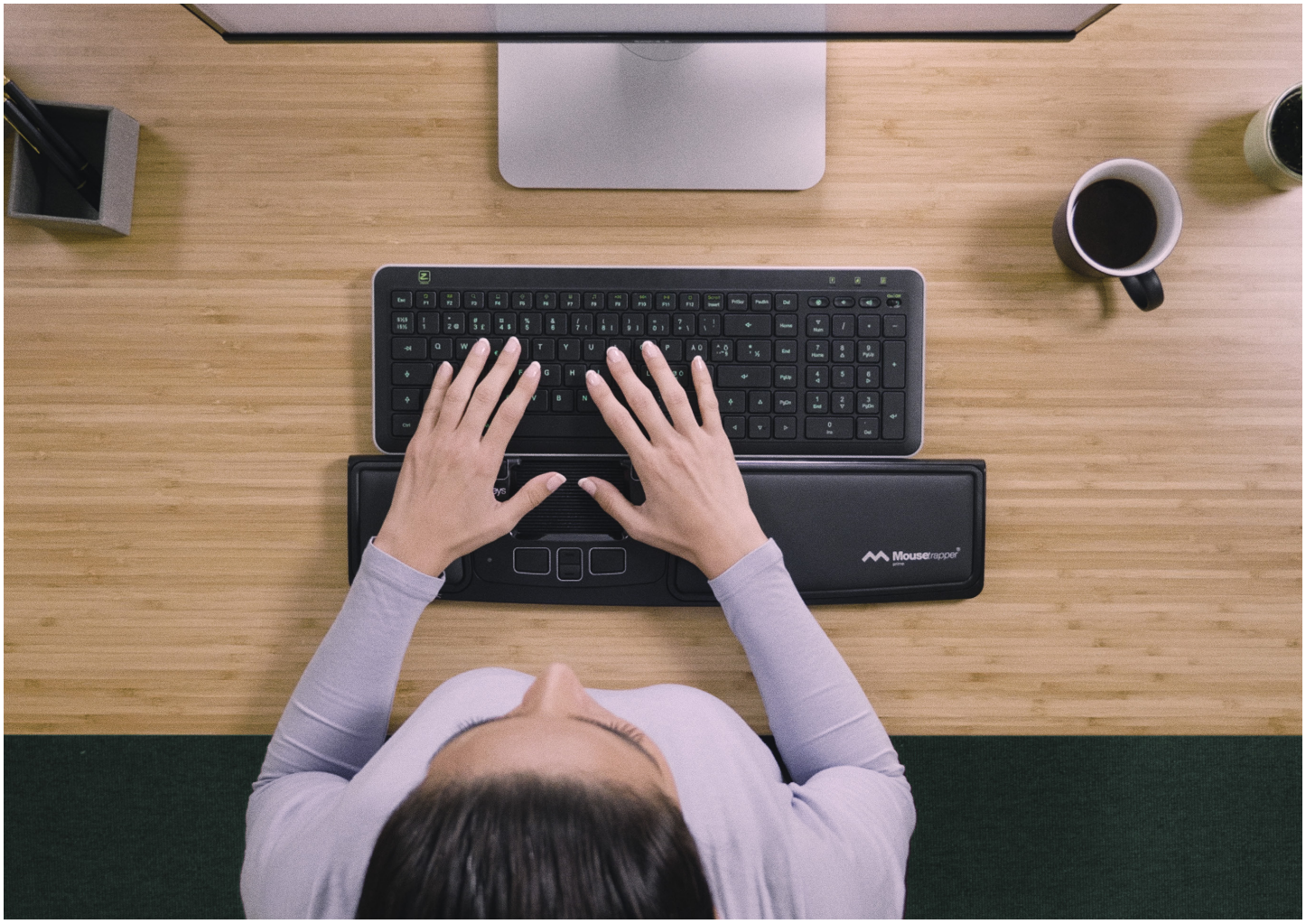
---

4 ISO 9241-5:1998

5 Dennerlein, J. T. A. J., P.W. 2006. Changes in upper extremity biomechanics across different mouse positions in a computer workstation. Ergonomics, 49

6 A literature review of the effects of computer input device design on biomechanical loading and musculoskeletal outcomes during computer work. J.L. Bruno Garza/ J.G. Young

7 Evaluating the Effect of Four Different Pointing Device Designs on Upper Extremity Posture and Muscle Activity during Mousing Tasks. Michael Y.C. Lin, Justin G. Young, Jack T. Dennerlein



Three tips to less pain and a better posture

- Work as much as possible with your elbows inside the shoulders
- Find a good body position that you can vary
- Use smart ergonomic solutions to avoid problems

Mousetrapper®
the ergonomic mouse

www.mousetrapper.com

The Mousetrapper Moves

The working posture may have a significant impact on the risk of developing computer-related pain in your neck, shoulder or arm. A correct workstation set-up enhances the opportunity to avoid or having relieve from Repetitive Strain Injury (RSI).

As a human it is impossible to remain in a static posture the whole day, we must move. The most important is to attain a natural body position where joints are naturally aligned. It reduces strain on the musculoskeletal system and and lays the foundation for a healthy posture.

Visit www.mousetrapper.com – Take a Self assesment
At mousetrapper.com you will find some corrections and solutions to a better work environment and to reduce the risk of having chronic computer-related pain, RSI. We call it the Mousetrapper Moves.