

Visual ergonomics and computer work – is it all about computer glasses?

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Abstract. The Swedish Provisions on Work with Display Screen Equipment and the EU Directive on the minimum safety and health requirements for work with display screen equipment cover several important visual ergonomics aspects. But a review of cases and questions to the Swedish Work Environment Authority clearly shows that most attention is given to the demands for eyesight tests and special computer glasses. Other important visual ergonomics factors are at risk of being neglected. Today computers are used everywhere, both at work and at home. Computers can be laptops, PDA's, tablet computers, smart phones, etc. The demands on eyesight tests and computer glasses still apply but the visual demands and the visual ergonomics conditions are quite different compared to the use of a stationary computer. Based on this review, we raise the question if the demand on the employer to provide the employees with computer glasses is outdated.

Keywords: eyesight test, computer glasses, new display screen technique, visual ergonomics, demands on the employer

1. State of the art

The Swedish Provisions on Work with Display Screen Equipment (AFS 1998:5) demand the employer to see to it that an employee normally having to work with a display screen for more than one hour during the working day undergoes an eye and eyesight test. If necessary, the employer shall provide the employee with special corrective appliances tested for the display screen work concerned. The provisions have been in force since 1986 [4].

In 1990 the EU directive on the minimum safety and health requirements for work with display screen equipment came into force (90/270/EEC) [2]. The directive states that the workers shall be entitled to an appropriate eye and eyesight test carried out by a person with the necessary capabilities:

- before commencing display screen work,
- at regular intervals thereafter, and
- if they experience visual difficulties which may be due to display screen work.

If necessary and if normal corrective appliances cannot be used, workers must be provided with special corrective appliances appropriate for the work concerned (90/270/EEC).*

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Both the Swedish Provisions and the EU Directive cover other important issues regarding visual ergonomics e.g. lighting, glare, contrast and visual angles. But most of the attention from employers and employees is given to the demands for eyesight tests and computer glasses. We feel that at times the prevailing opinion is that most visual ergonomics deficiencies at the workplace can be solved by providing the employees with special glasses. Other important visual ergonomics factors are at the risk of being neglected. In the ongoing revision and merging of the EU Directives on manual handling and display screen work as much emphasis as before seems to be put on eyesight tests and special computer glasses.

2. Approach

A review of the last years e-mail questions to the Swedish Work Environment Authority regarding computer work shows that 40 % were related to eyesight test and special glasses for the work. Only 12% of the questions were related to other visual ergonomics aspects. Many of the other questions were related to the physical layout of the workstation and working postures. There were also questions on the organization of the work; strain and stress.

The most common questions relating to eyesight tests and special glasses were employees asking what rights they have and how much the employer should pay. But there were also employers asking what responsibilities they have. They could be asking for guidance with respect to what their employees had asked them to pay, e.g. the costs for the eyesight test the glasses and the spectacles frames.

The information we give on our website and in our answers is clear. The employer is only obliged to pay for special corrective glasses if the examination by the optometrist shows that the employee needs such glasses for the computer work. The employer also needs to pay for a pair of spectacles frames, but the employer can limit the costs for the frames. If the employee wants something which is not covered by the law, for example spectacles frames outside the boundary of the costs, the employer has every right to say no. The special corrective glasses for the computer work are working equipment which belongs to the employer. If the employee wants to use the working equipment outside work, he or she should have the employer's permission.

On our website we have frequently asked questions (FAQ) on computer work and 65% concern eyesight test and computer glasses. Of the other FAQs one is about visual ergonomics, namely one on display screen size. 20 % of the FAQs concern emissions from the equipment.

The Swedish Provisions (AFS 1998:5) give guidance on how to apply the requirements. The guidance says that "eye and eyesight tests can appropriately be arranged through occupational health services, if available. Through workstation examinations, the occupational health services can analyze and document the visual requirements of the work and other factors contributing to good vision ergonomics and, competence permitting, take charge of the eye and eyesight tests. In order to serve its purpose, the eyesight test must be designed according to the visual requirements of the work". Based on information from optometrists and ergonomists at occupational health services in Sweden, we know that too often the eyesight test is not based on a proper workstation examination. One reason is that many small and medium enterprises (SMEs) are not attached to an occupational health service (OHS). 98 % of the companies in Sweden have less than 20 employees and only about 25 % of those are attached to an OHS. Furthermore, a study from 2003 showed that 16 % of the small companies who were attached to an OHS only had a basic agreement that provided for limited support via telephone and some written information [1].

Usually small companies do not have the expertise required to perform the workstation examination themselves. This may lead to that the computer glasses are not appropriate with regard to the visual requirements.

Inappropriate eyewear may have several negative consequences. Eye strain symptoms such as smarting and gritty feeling as well as headache are common effects. Furthermore, if you cannot read properly on the screen, you will adjust your working posture to be able to see better. This may lead to a strenuous working posture causing discomfort and pain in the neck, the shoulders, and the back.

Today, most people in Sweden use computers both at work and at home. In 2010, 91% of the Swedes in the age of 16-74 years had Internet and computer access at home [3]. The employer is only obliged to provide an employee with glasses which are needed and specially designed for the working situation. Glasses which the employee uses both at work and at home are not a concern for the employer. But if the employee need special computer glasses at work he or she is likely to need them at home as well. And when more and more time is spent using computers outside work it is debatable whether it is the employer's responsibility to cover for the eyeglasses.

The technique is also changing. We use laptops, PDA's, tablet computers, smart phones, etc. They are all defined as display screen equipment and the demands on eyesight tests and computer glasses apply. But the visual demands and the visual ergonomics conditions are quite different compared to the use of a stationary computer.

3. Conclusions

Based on this review we would like to raise the question if the demand on the employer to provide the employees with computer glasses is outdated.

The Swedish provisions and the EU Directive are quite old. The requirements regarding eyesight tests and glasses which are especially adapted for display screen work are based on research and studies conducted more than 20 years ago. The display screen technique has changed a lot since then. The quality of the screens is much better. The increased use of laptops, PDA's, tablet computers, smart phones leads to more flexibility and variation when working. The visual angles and viewing distances are easier to adjust.

It is also important to stress that we still use stationary computers to a great extent and the most frequent and intense use is still at work. Hence, we do not believe that the demands on the employer to provide the employees with computer glasses should be completely abolished. In our opinion the demands should be restricted to the use of stationary computers.

There is also a need to define the extent to which a person has to read a computer screen per day for a visual test to be necessary. The purpose is to prevent ill-health and the limit in the Swedish provisions of more than one hour during the work day is most likely too strict today with regard to the much better display screen technique and the improved visual quali-

ty. We need results and guidance from recent research to find the appropriate level.

References

- [1] A-B. Antonsson and L. Schmidt, Småföretag och företagshälsovård – ska berget komma till Muhammed eller Muhammed till berget?, IVL report B1542, IVL Swedish Environmental Research Institute Ltd. Stockholm, 2003.
- [2] European Council. Council Directive 90/270/EEC of 29 May 1990 on the minimum safety and health requirements for work with display screen equipment (fifth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC), 1990.
- [3] Statistics Sweden. Use of computers and the Internet by private persons in 2010.
- [4] Swedish Work Environment Authority. Swedish Provisions on Work with Display Screen Equipment, AFS 1998:5, 1998.