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Exercises to reduce musculoskeletal discomfort for people doing a range of static and repetitive work

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Research Report

HSE

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Exercises to reduce musculoskeletal discomfort for people doing a range of static and repetitive work

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Previous research has recognised exercise as an intervention that may be effective in reducing the occurrence of musculoskeletal disorders (MSDs) amongst the workforce. The aims of this work are to undertake a brief review of literature to identify suggested exercises and any evidence of their benefit with the intention to compile a set of exercises that may be appropriate for inclusion in a leaflet or other publication.

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EXECUTIVE SUMMARY

OBJECTIVE

Previous research has recognised exercise as an intervention that may be effective in reducing the occurrence of musculoskeletal disorders (MSDs) amongst the workforce. The aims of this work are to undertake a brief review of literature to identify suggested exercises and any evidence of their benefit with the intention to compile a set of exercises that may be appropriate for inclusion in a leaflet or other publication.

FINDINGS

There were some similarities in the findings reported in the literature relating to exercises (and MSDs). However a large proportion of the studies were limited or contained inconclusive evidence of the effects of exercising during the working day. Also it was difficult to isolate the effect of short breaks from the effect of any exercise performed during them. The literature showed good evidence indicating that frequent rest breaks throughout the day may be effective in reducing the incidence of MSD discomfort during repetitive and static upper limb work.

A selection of exercises have been identified, which may reduce musculoskeletal discomfort experienced by people who carry out a range of static and repetitive tasks at work. A leaflet presenting a similar set of exercises was found on The Chartered Society of Physiotherapy website.

RECOMMENDATIONS

HSE should consider the evidence and decide the best way forward. Possible ways forward include HSE devising a leaflet containing these recommended exercises or for specialists or practitioners working within HSE to refer people to the leaflet produced by The Chartered Society of Physiotherapy.

1 INTRODUCTION

1.1 BACKGROUND

Musculoskeletal disorders (MSDs) are problems affecting the muscles, tendons, ligaments, nerves, soft tissues and joints. The awareness of MSDs in the UK has increased over recent years and around half of reported cases of work-related ill health are associated with MSDs.

Upper limb disorders (ULDs) are a subcategory of MSDs and are conditions which affect the hands, arms, shoulders and neck. There are certain risk factors, which increase the likelihood of developing ULDs at work. These include task-related factors such as repetition, working postures, forces applied and duration of exposure to the risk factors. As well as environmental-related factors such as the working environment, psychosocial factors and worker-related factors, including the individual differences of workers.

A variety of jobs involve a range of repetitive movements and/or static postures which can result in musculoskeletal discomfort. Repetitive movements refer to work that requires the same muscle groups to be used over and over again during the working day, or for prolonged periods. Rapid and/or prolonged repetition may not allow sufficient time for recovery and can cause muscle fatigue due to depletion of energy and a build up of metabolic waste materials. Repeated loading of soft tissues is also associated with inflammation, degeneration and microscopic changes. Fast movements and acceleration require high muscle forces (HSE book HSG60).

Static postures occur when a part of the body is held in a particular position for extended periods of time. Static loading restricts blood flow to the muscles and tendons etc, resulting in less opportunity for recovery and metabolic waste removal. Muscles holding a static posture typically fatigue very quickly (HSE book HSG60). For example, this may be the case when maintaining the body in a position to do work or when holding a work piece steady.

There is an acceptance that at present there is little or no statistically significant empirical evidence of exercises in decreasing MSD symptoms. However there is anecdotal evidence (Lock and Colford [2005]). On this basis coupled with some requests to HSE staff for information on exercises that might be beneficial, the decision was made to do this work. This is therefore a brief review of literature to identify reportedly potentially beneficial exercise examples.

HSE has limited information that they can provide to individuals who suffer from musculoskeletal discomfort during repeated or static use of upper limbs. HSE do suggest that taking breaks are beneficial (HSE book L26), but there is no further information available on what employees can do during these breaks to maximise the benefits in terms of reducing musculoskeletal discomfort. Therefore HSE have asked HSL ergonomics team to briefly explore this area and identify exercises that are reported to be beneficial as well as any evidence to support this.

1.2 AIMS AND OBJECTIVES

1.2.1 Aim

The overall aims of this work were to:

1. Explore the evidence of potential benefits in terms of reducing the likelihood/risk of musculoskeletal discomfort by performing exercises (or stretches) during short breaks when undertaking repetitive or static upper limb related work.

2. Identify possible exercises that workers could perform at their place of work during these short breaks, to alleviate musculoskeletal discomfort experienced during repetitive or static upper limb related work. These exercises would then be collated in a leaflet if appropriate.

1.2.2 Objectives

The main objectives for this work are to;

- Conduct a brief literature review of research conducted within this area.
- Consider the evidence relating to exercises performed during the working day in terms of a reduction in reports of MSDs.
- Identify appropriate exercises for upper limb areas of the body which may suffer from musculoskeletal discomfort due to work tasks.
- If appropriate recommend contents for a leaflet presenting exercises that employees could perform at work.

2 METHODOLOGY

A literature search was conducted by the HSE Information Centre search team. Articles from academic journals as well as articles from health and safety related and other trade magazines were retrieved. The databases searched were: HSELINE; HEALSAFE; MEDLINE; Occupational and Environmental Medicine, Applied Ergonomics and Ergonomics.

The key words used were: upper limb; work related discomfort; static work; repetitive work; exercise; postural discomfort; benefits of exercise; alleviate postural discomfort; physiotherapy advice.

Articles included in this review were chosen from their abstract.

3 LITERATURE REVIEW

A number of studies have been conducted to identify the significance of performing exercises throughout the working day as a method of preventing the occurrence of musculoskeletal discomfort. Lock and Colford [2005] investigated the benefits of exercise at work and referred to different types of exercises. The report reviewed literature with reference to the effect of exercising on work related musculoskeletal disorders. They categorised exercises into four main types;

1. Limbering up exercises,
2. Exercises for general health and fitness,
3. Exercises for rehabilitation,
4. Exercising to reduce fatigue.

This report focuses on 1: Limbering up exercises. This refers to short, light to moderate exercises, which may include warming up and/or stretching, performed everyday and often throughout the day in order to loosen up and prepare the body to work. Lock and Colford [2005] refer to limbering up exercises for physical work (e.g. manual handling). However this report is limiting the scope to repetitive upper limb work.

Since performing exercises whilst at work is likely to interrupt work flow, they are most likely to need to be performed during a break from work. There is a body of literature concerning work – rest regimes and the benefits in terms of health and productivity. Some of these studies have also considered exercise in combination to break regimes. It is difficult to consider the two in isolation and the evidence surrounding work breaks and musculoskeletal discomfort and ill health is discussed first.

3.1 THE SIGNIFICANCE OF BREAKS

Workers who perform static or repetitive work should have frequent breaks to ensure that muscular fatigue does not reduce performance or adversely influence health.

Various research conducted by Murrell [1971], Rohmert [1973], Sundeling & Hagberg [1989] and Fisher *et al* [1993] all found that workers usually wait until they experience musculoskeletal discomfort before taking a rest break whereas short rest breaks earlier in the work spell can prevent (or delay) such problems occurring.

3.1.1 Break frequency

Breaks allow workers to vary their posture and should be taken when performance and productivity are still high and before the workers start getting tired. This is better than taking a break to recover from fatigue (HSE book L26).

Frequent rest breaks have been recommended as a means of reducing static loads on the musculoskeletal system during research by Sundelin and Hagberg [1989], however they also noted that exercising during these breaks had no effect on reducing shoulder discomfort. Fisher *et al.* [1993]. Investigated optimum rest break profiles and determined that there is a reduction in repetitive strain injuries when frequent breaks are taken.

Rohmert [1973] found benefits from short rest breaks, especially related to the rapid rate of recovery that occurs during the initial proportion of a rest period. Rohmert [1973] found that short rest breaks do not compromise a workers adaptation to work.

Appropriate timing of breaks is also important. Short frequent breaks are more satisfactory than occasional, longer breaks. Henning *et al*. [1997], found that short (30 – 60 seconds) rest breaks from computer work at 15 minute intervals throughout the day helped to improve musculoskeletal discomfort and worker productivity.

McLean *et al* [2001] also researched the benefits of micro breaks on computer terminal workers. This research investigated myoelectric signals (MES), behaviour, perceived discomfort and worker productivity while individuals performed their usual keying tasks. There were three groups during the study: A control group who took micro breaks at their own discretion, a group who took micro breaks at 20 min intervals, and a group who took micro breaks at 40 min intervals. They concluded that micro breaks had a positive effect on reducing discomfort in all areas studied during the computer terminal work, particularly when breaks were taken at 20 min intervals.

Galinsky *et al* [2000] examined the effects of supplementary rest breaks on musculoskeletal discomfort, eyestrain, mood, and performance in data-entry workers. Discomfort was significantly reduced within different areas of the body under the supplementary rest breaks group compared to the conventional break schedule group.

The timing of breaks needs to be carefully considered. According to Looze *et al*, [2002] stringent cued break schemes could seriously disrupt the normal activities of work and reduce the willingness of subjects to participate in studies.

3.1.2 Breaks and the effect on productivity

Galinsky *et al*. [2007] researched the effects of supplementary breaks and exercise for data entry operators as an expansion of previous NIOSH-RSI research. The study found that supplementary breaks reliably reduced discomfort and eyestrain without impairing productivity. However in practice the stretch group did not perform the stretches during 70+% of the breaks and therefore concluded that stretching had no significant effect on discomfort or performance.

Trujillo and Zeng. [2006] studied data entry worker's perceptions and satisfaction response to the "stop and stretch" software program and found that 63.3% of subjects thought that the stretch break software had a positive effect on their productivity. Therefore, from this limited evidence, it appears that well-timed supplementary breaks can be taken at work without impairing productivity.

Experiments conducted in field settings; Sundelin *et al* [1986], Sundelin & Hagberg [1989] and recent laboratory studies at National Institute for Occupational Safety and Health (NIOSH) Sauter & Swanson [1992], Swanson & Sauter [1993] indicate that worker productivity and well-being can benefit from short breaks from continuous computer work. Rest breaks in these studies lasted between 15 seconds and 3 minutes and occurred every 6 to 10 minutes. They were designed to supplement rather than replace conventional mid-morning and mid-afternoon rest breaks.

Galinsky *et al* [2000] found that data entry performance was not reduced when they examined the effects of supplementary rest breaks on musculoskeletal discomfort, eyestrain, mood, and performance in data-entry workers.

Dababneh *et al* [2001] researched the impact that added rest breaks had on productivity and well being of workers in a meat-processing plant. They found that the added rest breaks did not have a negative effect on productivity.

McLean *et al* [2001] researched the benefits of micro breaks on computer terminal workers and concluded from the study that micro breaks showed no evidence of a detrimental effect on worker productivity.

3.1.3 Computer cued breaks

A few studies were found that researched the effects of 'cued' exercise breaks on MSD reduction. Computer software cues the operator to take regular breaks at set intervals. Trujillo and Zeng. [2006] noted that prevention of MSDs could be tackled through employee education, modified workspace design, adjusting work habits, exercise, stretches and short breaks. The study had a relatively small sample of participants (19 computer users), but it was found that the 'stop and stretch' software could prove to be a valuable instrument in decreasing the incidence of MSDs. During the study 52.2% of participants noticed a difference of symptoms after using the program.

Looze *et al*, [2002] also reported investigating how cued micro-breaks affected self-reported severity and recovery of upper limb disorders in computer operators. They discovered that subjects who are cued to take extra breaks, perceived more recovery, 55% compared to 35% of control group and reported less deterioration (4%) when compared to control group (20%). The effect on the severity level of the complaint was not detected during the study and they also found no effect of the physical exercise which one group performed during the cued breaks.

The study by Monsey *et al*, [2003] explored the effectiveness of computer cued software in increasing compliance with a stretching program designed to prevent repetitive strain injury (RSI) associated with prolonged computer use. This study found that the computer software had a positive impact on the frequency of stretch breaks, as the mean number of breaks per hour were increased when the computer software was used. However no significant conclusion was made on the relevance of stretching during these breaks due to non-compliance of stretches by the participants.

3.2 SUMMARY OF BREAKS

There are some similarities in the findings of these studies relating to breaks suggesting that there is a body of evidence supporting the effectiveness of frequent breaks throughout the day in reducing musculoskeletal discomfort and ill-health. The main points from the research are:

1. The intervention of breaks during the working day can help reduce musculoskeletal discomfort, Galinsky *et al*, [2007].

2. Productivity was not affected by introducing breaks into the working day, Trujillo and Zeng, [2006].

3. The intervention of computer cued breaks in computer work indicated that subjects perceived more recovery of upper limb discomfort in computer users compared to the non cued break group, Looze *et al* [2002].

3.3 TASK VARIATION

Task variation during periods of repetitive work has been an area of interest related to alleviating fatigue and the risks of sustaining MSD. Task variation covers such factors as postural change during work, changes in task characteristics as well as breaks, and especially breaks that include an exercise regime, or a variation in posture from that when working. This is a large topic area, and a detailed appraisal of which is beyond the scope of this review. However, there is general agreement that variation in postures and movements is positive, even if there is little high quality scientific evidence of this. Increased variability between tasks in the job of an individual can be achieved by introducing new tasks that vary the postures and movements required [Moller *et al*, 2001, HSE, 2002, Canadian centre for occupational health and safety, Brown and Mitchell, 1988, Ergo in demand, Occupational safety and health, 1991 and the Swedish work environment authority, 2005]. Similarly, performing exercises can be considered as a way of providing variation of posture and movement without changing the primary task. Any such exercises should be targeted to provide the most benefit.

Introducing exercise breaks (or conventional breaks) is an additional way of increasing 'variation' in the job, which does not require work tasks to be reallocated among workers. This may be one of the explanations why the use of rest pauses is one of the most frequently recommended interventions against musculoskeletal disorders as shown by Konz [1998].

3.4 EFFECTS OF EXERCISE

There has been an increased interest in the effect that exercise has on preventing musculoskeletal discomfort. Previous research has tried to investigate the benefits of exercise, however the studies were generally limited in the number of participants taking part and by the experiment durations. A reoccurring finding in many of these studies is that the participants did not perform all the exercises for the whole duration of the studies, therefore it is hard to analyses the significance of the results from these studies.

Three of the studies noted that the participants in the 'no exercise' condition walked during most of their breaks – a factor that also reduced the difference between physical activity levels of the two groups [Henning *et al*, 1997. Van de Heuvel *et al*, 2003. Galinsky *et al*. 2007].

3.4.1 Regular exercise/stretching

The research by Fenety and Walker [2002] studied the impact of regular exercise at a workstation on musculoskeletal discomfort in 11 VDU operators. The participants of the study who engaged in exercise reported a short-term reduction of musculoskeletal discomfort. This work supports that by Henning *et al*. [1997], where it was determined that short rest breaks combined with exercise were more effective than passive rest breaks for computer workers. These indicate that active recovery is more effective at reducing musculoskeletal discomfort than passive recovery. Henning *et al*, [1997] did not specify the types of exercises used and whether or not stretching was included.

Galinsky *et al*. [2007] found that supplementary breaks that were intended to include stretching breaks reliably minimized discomfort and eyestrain without impairing productivity. Low compliance in performing stretches prevented a valid assessment of stretching effects.

Kietrys *et al*. [2007] investigated the effect of exercise at work (targeting neck, shoulders and the upper back) on 72 computer operators over a period of 4 weeks. They concluded that most subjects found the resistance and the stretching exercises easy to do, performed them 1 to 2 times daily and said they reduced discomfort. Kietrys *et al*, [2007] also recommend further research to determine the optimal type and frequency of at-work exercise.

Lock and Colford [2005] studied international literature relating to the benefits of limbering up exercise at work and this included the benefits of reducing symptoms of musculoskeletal discomfort. Limbering up referred to moderate exercises, which may include warming up and/or stretching performed every day and often throughout the day. They concluded that there was not enough evidence to recommend health and fitness programmes and that there was also not enough evidence to recommend limbering up programmes to industry. This is because the evidence for the benefits of limbering up exercises was not specific or reliable enough.

Omer et al, [2003/2004] also carried out a study on the effectiveness of training and exercise programs in the management of MSDs. They trained the participants in mobilisation, stretching, strengthening and relaxation exercises, and found that these exercises reduced reported experiences of MSD pain and depression levels within participants in the short term.

Miranda *et al* [2001] studied how work related factors and physical exercise could be used as a predictor of shoulder pain. However an outcome of the study was that physical exercise had more value than damaging effects on the shoulder.

3.4.2 Evaluating exercise

Research by Lee *et al*. [1992] evaluated 127 individual exercises that had been recommended for the prevention of musculoskeletal discomfort among VDT/office workers. It was found that in the majority of cases the prepared instructions for the exercise were satisfactory and that the exercises could be readily performed at the workstation. However they also noted that over a third of the exercises were conspicuous and potentially embarrassing to perform and that half of the exercises would significantly disrupt the work routine.

3.4.3 Other factors to consider

Employee acceptance of performing exercises is an important factor that needs to be considered when it is planned to introduce exercise into workplaces. Trujillo and Zeng [2006] touched on this when they researched computer operator's perceptions and satisfaction responses to some new software to encourage workers to 'stop and stretch' during the working day. The program had sufficient usability and acceptance within a workplace setting and might be applicable more widely.

3.5 LIST OF LIMITATIONS OF THE RESEARCH REVIEWED

There are some limitations in the research reviewed relating to exercises that includes either limited or inconclusive evidence for the effectiveness of exercising during the working day in terms of reducing musculoskeletal discomfort. The main limitations of the reviewed research are:

- It is difficult to isolate the effect of breaks from exercise, and the comparison of exercise and non-exercise groups did not always show a significant difference.

- The exercises were not performed at every break during the research, Galinsky *et al* [2007], Henning *et al* [1997], Van den Heuvel [2003]

- Participants in the non-exercise groups walked during their breaks.

- The exercises/stretches used in the reported research were not described, Henning *et al* [1997]

3.6 SUMMARY OF EVIDENCE FOR THE USE OF EXERCISE BREAKS

There are some similarities in the findings of these studies relating to exercising during the working day in reducing musculoskeletal discomfort and ill-health. The main points from the research are:

1. Short rest breaks with exercise were more effective at reducing musculoskeletal discomfort in the short term than passive breaks, Fenety and Walker [2002], Henning *et al*, [1997].

2. Some studies reviewed were found to be inconclusive research therefore it is hard to draw a conclusion about the effect exercise has on musculoskeletal discomfort, Galinsky *et al*. [2007], Kietrys *et al*. [2007], Lock and Colford [2005].

4 SELECTION OF THE EXERCISES

A scan of current literature was conducted using key words (such as; exercise, upper limbs, work related discomfort, static and repetitive work) to identify relevant publications related to this area. An Internet search was also carried out to identify any current research and recommendations linked with exercising during the working day. During the review of literature, it became apparent that the main upper body areas identified as needing exercise to help reduce the occurrence of upper limb discomfort are the neck, shoulders, upper back, arms/wrists and hands.

Exercising and stretching can have the following benefits: It helps increase circulation, alertness and concentration. Exercise can improve perceived comfort of muscles and joints if they have been held in static postures or used in repetitive ways. Using exercise appropriately may prevent muscle and joint pain.

The exercises presented here have been selected on the basis that they target a specific area of the body, the time required is only minimal, they are not conspicuous to perform and there are no long term effects from performing them.

4.1 EYES

Exercises for the eyes should be conducted during work with display screens. The eyes may become fatigued if eyes are fixed on the screen/object for long periods of time and blinking may become less frequent. ‘Horizon scanning’ is an exercise which could help reduce eye fatigue.

4.1.1 Horizon scanning

HSE Book; L26 suggests that DSE users should be able to vary their postures during breaks. It suggests that DSE users should perform body stretches, blink their eyes and focus on a distant object. The closer the eye has to focus on objects, the greater the load on the eye muscles. When the eye focuses on objects in the distance, the eye muscles relax. Therefore helping to relieve and reduce eye fatigue.

‘Horizon scanning’ is also suggested by The Chartered Society of Physiotherapy (UK), Magnitude International, RSI Warrior & University of Sydney.

Instructions: Focus on an object about 3m away for duration of 15 seconds.

Is the exercise conspicuous: No

4.2 NECK

During static and repetitive upper limb work muscles tend to be held in a particular position for extended periods or are used over and over again for prolonged periods. A build up of metabolic waste occurs within the muscles and can result in muscle fatigue. This can occur within the neck, especially when the task is visually intensive. ‘Neck glides’ are an exercise which could help to reduce muscle discomfort within the neck.

4.2.1 Neck glide

Lee *et al*. [1992] evaluated the neck glide exercise and found that it was beneficial to VDT workers in reducing musculoskeletal discomfort. 'Neck glides' are also suggested by The Society of Radiographers.

Instructions: Sit or stand up straight, glide head back, as far as it will go. Keeping head and ears level. Now glide head forward. Repeat 3 times.

Muscle groups recruited:

1. Lower cervical, thoracic and lumbar extensors, neck flexors.
2. Upper cervical extensors and neck flexors.

Anatomic Structures stretched:

- Anterior ligaments of the lower cervical and thoracic spine, upper cervical extensors.
- Posterior ligaments of the lower cervical and thoracic spine, lower cervical and thoracic extensors.

Is the exercise conspicuous: Somewhat.

4.3 SHOULDERS

Exercises such as 'shoulder shrugs' or 'shoulder circles' can help to reduce muscle discomfort caused by the build up of metabolic waste within the muscles.

4.3.1 Shoulder shrug

Lee *et al*. [1992] evaluated the shoulder shrug exercise and found that it was beneficial to workers. 'Shoulder shrugs' are also suggested by The Society of Radiographers and at: Shelter Online

Instructions: Sit or stand up straight, bring shoulders up towards ears. Hold for count of 3 seconds. Relax and repeat twice (perform three times in total).

Muscle groups recruited: Scapular upwards rotators and adductors.

Anatomic Structures stretched: Scapular downward rotators.

Is the exercise conspicuous: Somewhat.

4.3.2 Shoulder circles

Lee *et al*. [1992] evaluated the 'shoulder circles' as an exercise and found that it was beneficial to workers. 'Shoulder circles' are also suggested at: RSI Warrior & Magnitude International.

Instructions: Sit or stand up straight, circle shoulders backwards three times, with arms relaxed by the side.

Muscle groups recruited: Scapular upwards rotators and adductors, scapular downward rotators and shoulder abductors.

Anatomic Structures stretched: Scapular downward rotators and abductors, scapular upward rotators and abductors.

Is the exercise conspicuous: Somewhat.

4.4 UPPER BACK

Exercises such as ‘upper back stretches’ could be performed to reduce the muscle fatigue/discomfort within the upper back.

4.4.1 Upper back stretch

Lee *et al*. [1992] evaluated various back exercises and found that the ‘upper back stretch’ was the most beneficial to workers. Mainly because the other back exercises could produce a variety of complications when they were carried out, however the ‘upper back stretch’ was only found to have one possible side effect. This was that it might aggravate acute inflammatory or arthritic conditions of the shoulder. ‘Upper back stretches’ are also suggested by The Society of Radiographers.

Instructions: Cross arms and raise hands to rest on the front of the shoulders, using the arms push shoulders back. Keep elbows down, Hold for 15 seconds. Repeat 3 times.

Muscle groups recruited: Scapular adductors, upward rotators, shoulder vertical and horizontal abductors, external rotators.

Anatomic Structures stretched: Scapular abductors, downward rotators, shoulder internal rotators and horizontal adductors.

Is the exercise conspicuous: Somewhat

4.5 FOREARMS AND WRISTS

Static and repetitive upper limb work can cause a build up of metabolic waste in the muscles. Forearm and wrist stretches could be performed to release muscle discomfort within the ‘forearms and wrists’.

4.5.1 Forearm and wrist stretch

The Chartered Society of Physiology (UK), The Society of Radiographers and the Osmond Group LTD all recommend that the best way to stretch the forearms is to perform a forearm and wrist stretch.

Instructions: Sit or stand up straight, extend one arm in front, elbow straight and hand flexed. Stretch forearm muscles by placing the palm of the other hand across the front of the first hand and push towards the body. Hold for five seconds.

Is the exercise conspicuous: Somewhat.

4.6 HANDS

Exercises such as ‘forward presses’ could be performed to reduce muscle discomfort within the hands when muscles are fatigued due to static or repetitive work.

The Chartered Society of Physiology (UK) recommends that the best way to exercise the hands/fingers is to perform a forward press.

4.6.1 Forward press

Instructions: Gently interlock your fingers. Press your palms away from your body, gently stretching the forearm muscles, fingers and the muscles between your shoulder blades. Hold for five seconds.

Is the exercise conspicuous: Somewhat

5 CONCLUSIONS

A selection of exercises have been identified that may reduce musculoskeletal discomfort that can be experienced by people who carry out a range of static and repetitive tasks at work. Although the majority of the evidence was related to display screen equipment work, there is considered to be enough similarity with other upper limb intensive work for the exercises to be considered more widely applicable. Therefore it is considered that the exercises identified should be beneficial to people carrying out any repetitive and/or static upper limb related tasks at work. It is recommended that these exercises be performed during breaks throughout the working day. All the exercises suggested could be performed at the workstation and only require a few seconds to perform. Using this information a leaflet could be put together containing all the recommended exercises, which would be clear and easy for workers to follow.

During the search of current literature a leaflet called ‘Fit to work exercises’ was found. This is a leaflet that has been produced by The Chartered Society Of Physiotherapy (CSOP) and contains a range of exercises for the upper body. Most of the exercises within the leaflet are very similar to the ones that have been identified elsewhere during this research. If HSE did not want to produce a badged publication on exercises, then specialists or practitioners working within HSE could refer people to this CSOP leaflet, which is accessible on the internet. A link to the CSOP leaflet can be found within the references section of this report.

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Exercises to reduce musculoskeletal discomfort for people doing a range of static and repetitive work

Previous research has recognised exercise as an intervention that may be effective in reducing the occurrence of musculoskeletal disorders (MSDs) amongst the workforce. The aims of this work are to undertake a brief review of literature to identify suggested exercises and any evidence of their benefit with the intention to compile a set of exercises that may be appropriate for inclusion in a leaflet or other publication.

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