



Work related musculoskeletal disorders in the service and retail sectors

Summary

The service and retail sectors offer a wide range of jobs including in shops, restaurants, offices, distribution and entertainment. Many are physically demanding, and workers in these sectors are particularly at risk from back and upper limb disorders. Many factors can contribute — either individually or in combination — to the development of musculoskeletal disorders (MSDs). Among the biggest factors in the retail and service sectors are awkward and static postures, lifting and pushing, repetition, vibration and the cold. As well as physical factors, organisational factors such as low job satisfaction and individual factors such as medical history, physical capacity and age are also significant. In order to reduce the risk of MSDs, retail and service sector employers need to understand more about MSDs and take action. This includes carrying out risk assessment and control, training employees and providing the correct workplace equipment. Ergonomic principles (ergonomics is the study of the relationship between workers and their working environment and equipment) should be taken into account when introducing change at the workplace. Designing work and workstations to fit workers' capabilities is essential; in other words, fitting the job to the worker, not the worker to the job.

Introduction

Musculoskeletal disorders (MSDs) can affect the body's muscles, joints, tendons, ligaments, bones, nerves and localised blood circulation system. Most work-related MSDs develop over time and are caused either by the work itself or by the employees' working environment. They can also result from accidents, e.g. fractures and dislocations. Typically, MSDs affect the back, neck, shoulders and upper limbs; less often they affect the lower limbs. Health problems range from discomfort, minor aches and pains, to more serious medical conditions requiring time off work and even medical treatment. In more chronic cases, treatment and recovery are often unsatisfactory — the result could be permanent disability and loss of employment.

This information sheet aims to inform occupational safety and health (OSH) practitioners, labour inspectors, employers and workers about the hazards and risks of MSDs in the service and retail sectors, and to provide information on good ergonomic practice to reduce risk.



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The service and retail sectors offer a broad range of jobs and tasks. According to Regulation (EC) No 178/2002ⁱ on food safety, 'retail' means the handling and/or processing of food and its storage at the point of sale or delivery to the final consumer. It includes distribution centres, catering operations, factory canteens, institutional catering, restaurants, shops, and wholesale outlets. The service sector includes insurance, tourism, banking, and entertainment.

Many service and retail sector activities are physically demanding; for example, driving and stocking shelves. They are also often carried out in extreme hot or cold temperatures, such as working in restaurant kitchens or in supermarket cold storage.

Hazards and risks for service and retail workers

Service and retail workers are particularly at risk from back and upper limb disorders, including:

- muscle strains and back injuries
- tendonitis
- carpal tunnel syndrome
- rotator cuff injuries
- epicondylitis
- trigger finger.

Many activities in service and retail work put workers at risk from developing MSDs. The most important risk factors are biomechanical and environmental. These include: manual handling, awkward and static postures, over-exertion (high force), repetition, contact stress, and exposure to vibration and cold. Psychosocial risk factors — which are related to work organisation such as the way work is organised, supervised or performedⁱⁱ; the interpersonal relations for example relations between supervisor-worker and worker-worker or the social support or feedback available; economic and financial aspects including wage, benefits and equity; and social aspects such as prestige and social statusⁱⁱⁱ — may also produce increased muscle tension and exacerbate biomechanical strains.

However, the presence of risk factors in a job does not necessarily mean that employees will develop MSDs. The level of risk also depends on individual

ⁱ Regulation (EC) No 178/2002 of the European Parliament and of the Council, of 28 January 2002, laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

ⁱⁱ Hagberg, M., B. Silverstein, e col. (1995). Les lésions attribuables au travail répétitif: ouvrage de référence sur les lésions musculo-squelettiques liées au travail, Éditions MultiMondes.

ⁱⁱⁱ NIOSH (1997). Musculoskeletal Disorders and Workplace Factors: A critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back, B. Bernard (ed.), National Institute for Occupational Safety and Health.



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characteristics such as medical history, physical capacity and age, and the measures put in place at the workplace to minimise risk.

Some examples of risk factors^{iv} that may lead to the development of MSDs in service and retail activities include:

Awkward and static postures:

- bending or twisting torso while lifting or holding heavy items
- lifting out or putting objects into cramped spaces
- frequent tasks involving:
 - leaning, bending forward, kneeling or squatting
 - working with wrists in a bent or twisted position
 - the use of hands below the waist or above the shoulders
 - operations done behind (pushing items to bagging) or to the sides of the body
- standing or sitting for most of a shift
- working with arms or hands in the same position for long periods of time without changing position or resting.

Force:

- lifting:
 - heavy lifting done with one hand or without the assistance of mechanical devices
 - heavy lifting while bending over, reaching above shoulder height, or twisting
 - holding objects with a pinch grasp
 - lifting items rather than sliding them over the scanner
- pushing, pulling, carrying:
 - pallet jacks, or other carts that are difficult to get started
 - existence of debris (broken pallets), uneven surfaces (cracks in the floor) or dock plates that could catch the wheels while pushing
 - pulling rather than pushing objects
 - heavy objects carried manually for long distances
- use of tools:
 - tools requiring the use of pinch grip or a single finger
 - too large or too small for the worker's hands.

Repetition:

- performing quick wrist motion while scanning

^{iv} OSHA (2004), 'Ergonomics for the prevention of musculoskeletal disorders — guidelines for retail grocery stores'. This includes checklists for the identification of ergonomic concerns and examples of ergonomics solutions in various jobs within this specific part of the retail sector:
<http://www.osha.gov/ergonomics/guidelines/retailgrocery/retailgrocery.html>



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- repetitive motions performed for several hours without break (slicing meat, scanning products)
- jobs requiring repeated finger force (packing bread, labelling with pricing gun).

Contact stress:

- contact with sharp or hard edges
- using hands as a hammer (closing containers)
- tool handles (a knife) pressing into the worker's palm.

Vibration:

- use of power-driven tools (hand-arm vibration)
- driving fork lifts, trucks and other vehicles (whole body vibration).

Cold:

- handling frozen items without adequate gloves
- working in cold environment without adequate garments.

Measures to prevent MSDs among service and retail workers

In order to minimise the risk of MSDs, employers should:

- understand the issues relating to MSDs and take action to minimise these risks in the workplace;
- create the right organisational environment — worker participation should be sought and valued, and responsibilities for risk assessment and management should be clearly allocated;
- provide training and information for employees — the importance of maintaining good postures and lifting/gripping correctly, recognising the early signs of MSDs and knowing when to take breaks;
- provide and maintain the correct equipment and train employees in its use;
- put in place clear reporting systems for accidents, ill health and highlighting risky activities;
- identify and assess ergonomic risks, and put in place monitoring and evaluation procedures.

Ergonomic risk identification and assessment

Ergonomics is the study of the relationship between workers and their working environment and equipment. The purpose of conducting an assessment using ergonomic principles is to identify work activities and workstation set-ups where the user's health and safety is at risk. It is



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important to be systematic when carrying out a risk assessment and to take into account all aspects of the work and not just concentrate on physical risk factors. For example, the HSE's risk assessment worksheets on upper limb disorders^v cover:

- repetition — for example, are tools used that require repetitive finger or thumb action?
- working posture (for fingers, hands and wrist, arms and shoulders, and head and neck) — for example, are the fingers gripping or used while the wrists are bent?
- force — for example, is a pinch grip being used repetitively or statically for more than two hours in total on each working day?
- working environment — for example, does the task involve holding cold tool handles, work items or other cold objects?
- psychosocial factors — for example, is the work well paced? Do workers find it difficult to keep up with their work?
- individual differences — for example, are new employees or those returning to work after a long break potentially at an increased risk of upper limb disorders?

The views of the worker should be taken into account throughout the risk assessment process, including the identification, assessment and controlling of risks.

As tasks within the retail and service sector are likely to be varied, it will often be necessary to break down each job into a number of tasks for assessment; for example, lifting, carrying and driving are all part of a delivery driver's work. There are a number of checklists and tools that can help in the assessment process:

- Quick Exposure Check (QEC) is a practical tool for the assessment of exposure to risks for work-related MSDs. It will help evaluate the effectiveness of any workplace action taken and provide guidance on how to break down a job into tasks for assessment. See: http://www.surreyergonomics.org.uk/index.php?option=com_content&task=view&id=5&Itemid=7
- Rapid Upper Limb Assessment (RULA) is a tool for ergonomic investigations of workplaces where work-related upper limb disorders have been reported. See: <http://www.rula.co.uk/>
- Rapid Entire Body Assessment (REBA) assesses workers' posture for risk. See: http://hsc.usf.edu/~tbernard/HollowHills/REBA_M11.pdf
- risk assessment worksheets from 'Upper limb disorders in the workplace' are an aid to risk assessment and help employers identify the potential risks of upper limb disorders and possible ways to reduce them. See: <http://www.hse.gov.uk/msd/pdfs/worksheets.pdf>

^v Health and Safety Executive, 'Upper limb disorders in the workplace' (HSG60), 2002. England: HSE Books.



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- the Manual Handling Assessment Chart (MAC) Tool helps the assessor identify high-risk workplace manual handling activities. See: <http://www.hse.gov.uk/msd/mac/index.htm>

Re-assessment should take place when changes occur to the workforce, equipment, work tasks or conditions, or after a problem has been reported.

Reducing the risk of MSDs among service and retail workers

Many musculoskeletal injuries are preventable. Employers must reduce any risks identified in the assessment process to the lowest level possible by introducing control measures. It is important that the workforce is consulted throughout this process so employers can gather ideas from the people who carry out and therefore know most about the work. This will also help to ensure that any action taken is worthwhile and should generate feedback on its effectiveness. Any action taken should be monitored and evaluated to ensure it has not introduced any new risks into the workplace.

An ergonomics approach should be taken when introducing change at the workplace: i.e. fitting the job to the worker, and not the worker to the job. Designing work and workstations to fit workers' capabilities is essential. Therefore, the employer should attempt to reduce the risks of MSDs by changing:

- equipment — for example, install a power in-feed conveyor at the point of sale to bring items to the worker rather than force the worker to lean and reach items further along the conveyor, and provide adjustable sit/stand workstations or adequate lumbar support for the worker to lean on;
- workplace layout and environment — for example, relocate items so that they can be reached without stretching, and ensure lighting is adequate so that workers can complete a task comfortably;
- work tasks and organisation — for example, mechanise or automate repetitive functions, work with suppliers to get lighter boxes to reduce the weight that has to be lifted manually, observe the work flow and, if necessary, re-organise it to reduce stress on the workforce;
- work procedures — for example, workers should be trained in the proper procedures for each task.

Addressing both physical ergonomic and psychosocial risk factors for MSDs will help reduce the risk of injury and ill health, control costs and reduce turnover. Work in the service and retail industry is diverse, from working with computers in a call centre, to lifting and moving heavy items in a shopping centre. Examples of possible solutions for common MSDs found in the sectors are shown in the annex. However, these are only suggestions; all



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action taken must be carefully considered and monitored, and evaluated for its effectiveness for a particular workplace or workforce.

Further information sources

- For the Agency's MSDs topic page, see:
<http://osha.europa.eu/topics/msd>
- For checklists, see: <http://office-ergo.com/a.htm>
- 'Guidelines for the Assessment of Supermarket Checkouts and the Prevention of Musculoskeletal Disorders' — <http://hse.gov.uk/lau/lacs/58-1.htm> — offers information on the safe design and use of supermarket checkouts based on Health and Safety Executive (HSE) research in the UK.
- 'Health and safety authority retail and distribution sectors — small and medium enterprises' includes risk assessment advice and summaries of the main risks for various jobs within the retail sector. See: http://www.hsa.ie/files/product_20040615105646RetDist.pdf
- 'ISO 6385:2004 — Ergonomic principles in the design of work systems'.
- For MSDs, see: www.hse.gov.uk/msd/index.htm
- For information on MSDs for the retail industry, see:
http://www.ufcw.org/workplace_connections/retail/safety_health_news_and_facts/rep_stress_overview.cfm
- There is useful information and advice from the Canadian Centre for Occupational Health and Safety on musculoskeletal injuries:
http://www.oshforeveryone.org/wsib/files/ont_whsc/swapmsi.htm
- For preventing back pain and other aches and pains to kitchen and food service staff, see: <http://www.hse.gov.uk/pubns/cais24.pdf>
- For the Canadian Centre for Occupational Health and Safety's safety information sheet on lifting and moving, pushing and pulling. see:
http://www.oshforeveryone.org/wsib/files/ont_esao/safetyinfo.html



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Annex: Solutions to common musculoskeletal problems

(Adapted from <http://office-ergo.com/a.htm>,
<http://213.212.77.20/pubns/indg242.pdf>,
<http://www.safecomputingtips.com/ventilation-ergonomics.html> and
http://www.oshforeveryone.org/wsib/files/ont_esao/safetyinfo.html)

Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
Head/Neck	Twisting the head to the side	Bring item closer to centre line of view
	Forward head posture (peering) or squinting	Lower monitor, document or work equipment to a comfortable height Tilt monitor back Check for monitor image quality problems, character height or monitor distance Suggest consultation with vision specialist
	Neck extended backwards, head tilted back, even slightly	Remove CPU (central processing unit) from under monitor Remove tilt/swivel base from monitor (leave ventilation space) Check for bifocals and suggest full-frame 'computer glasses' prescription
	Neck severely flexed (downward)	Tilt face of monitor back Tilt document — do not lay flat on work surface Raise monitor, document or work equipment to a comfortable height Adjust posture and provide training Check glasses for proper prescription
Trunk	Twisted torso	Rearrange work on desk or counter Provide more knee space Try u-shaped work surface layout Try swivel chair



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	Frequent or prolonged leaning or reaching	Rearrange work on desk or on counter by locating commonly used items within easy horizontal reach Provide mouse pad, palm or forearm support Bring mouse and keyboard closer to body Ensure work heights are appropriate, i.e. the worker does not have to adopt awkward postures to carry out the work activity Place items for lifting or moving in appropriate locations and at suitable heights
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Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
Arms	Prolonged hunched or elevated shoulder while holding the phone	Try telephone headset Try speakerphone (may disturb other workers)
	Raised or tensed shoulders	Habit or tension training Lower work surface or work equipment Lower chair armrests Raise chair if foot contact with the floor can be maintained
	Elbows splayed out (shoulder abduction)	Lower work surface Lower chair armrests Bring chair armrests in closer Awareness and habit training
	Elbow flexed for long periods using the telephone	Try telephone headset. Try speakerphone (may disturb other workers)
	Elbow or forearm resting for long periods on hard or sharp work surface, chair armrests	Pad or round surfaces, corners, and armrests Replace armrests Try telephone headset Habit training
	Working with one or both arms 'reaching' towards a mouse or keyboard or other work material	Bring keyboard closer to body Try mouse pad, palm or forearm rest Bring mouse or other equipment closer to keyboard Rearrange work on desk or on counter by locating commonly used items within easy horizontal reach
	Working with arms or hands in the same position for long periods of time without changing positions or resting	Introduce aggressive break schedule Inform users of risks involved Introduce job variety and rotation Look at automating part of job



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Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
Wrists/ Hands	Wrists bent to the sides when using equipment	Habit training Keyboard with more accessible keys or split keyboard design Try more appropriate equipment at the workplace and get worker feedback
	Wrists bent back (extended) or forward (flexed) for prolonged periods	Habit training Palm rest Lower, raise, or change slope of keyboard Try more appropriate equipment at the workplace and get worker feedback
	Wrists or palms resting for long periods on hard or sharp keyboard or work surfaces	Habit training Palm rest Padded or rounded surfaces, corners
	Hands held actively over the keyboard during keying pauses	Habit training Palm or forearm rest
	Rapid, sustained, or prolonged keying	Greater work variety Introduce aggressive break schedule Reduce overtime
	Forceful keying, key pounding	Habit training Light-touch keyboard
	Significant amounts of hand stapling, punching, lifting, opening mail, or other forceful exertions, especially combined with awkward postures	Try mechanical aids, e.g. electric stapler or punch Reduce size of lifted loads Bring heavy loads close to the body, at a medium height Sharpen letter openers



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Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
	Prolonged mouse use	Greater work variety Introduce aggressive break schedule Alternate hands Alternative pointing devices Try arm support, including small table Place mouse close to body (extended keyboard tray) or keyboard without numeric pad Learn keystroke substitutes for menus
	Tools require use of pinch grip or a single finger	Try other equipment where a greater part of the hand is employed Introduce job rotation Wear gloves
	Tools too large or too small for the worker's hands	Try other equipment Provide a selection of equipment sizes Wear gloves
	Handling frozen items	Wear gloves Introduce job rotation



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Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
Feet	Feet dangling, not well supported, or a posture which seems to put pressure on the backs of the thighs	Lower chair Lower work surface Habit training Foot rest (last resort)
Sitting	Prolonged sitting, especially in only one posture	Introduce greater work variety Introduce aggressive break schedule Chair that supports posture change, through movement, size, or easy adjustability Habit training Move phone/printer to other side of office to force standing; suggest standing when on phone Check chair fit Install a sit/stand work surface
	Lumbar back area not supported	Provide a lumbar cushion Show how to adjust backrest height/tilt Check chair fit, especially backrest/lumbar height
	Chair backrest not used for long periods	Check chair fit, especially seat pan depth/height Check leg room Check monitor distance & character height Habit training
Standing	Prolonged standing, especially in one posture	Introduce greater work variety Introduce aggressive break schedule Habit training Install a sit/stand workstation



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Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
VDU (visual display unit)	Reflected glare on the screen	Shield light sources Shade screen Move monitor so light enters from side angle, not back Do NOT tip monitor down Lower light levels Move light sources
	Too much contrast between screen and surroundings or document; worker feels relief when bright areas are shielded	Lower ambient light levels Turn off, reposition, or dim task lights Block offending light sources Change screen polarity to black on white
	Monitor closer than approximately 65 cm (25")	Push monitor back (enlarge font size) Computer glasses may be necessary Bring keyboard forward, possibly with a keyboard tray
	Different viewed objects (screen, documents) at different distances from the eyes	Use document stand or otherwise equalize distances to within about 10 cm (4") if rapid viewing changes are required
	Screen or documents not oriented perpendicular to the line of sight (tipped back slightly is even better)	Change monitor, document stand angle
	Prolonged near-focusing throughout the day with few far-focusing opportunities	Move monitor back as far as possible Habit training Rearrange space to provide view
	Monitor image dim, fuzzy, flickery, small, or otherwise difficult to read	Upgrade monitor Use software to enlarge image
Vision/ Illumination	Eyestrain complaints	Check all aspects of visual environment Suggest consultation with vision specialist



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Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
	Light sources that can be seen by the worker	Cover or shield light sources Rearrange work arena Lower other viewed objects to lower field of view
	Very bright ambient lighting (above 500 lux or 50 fc) or shadowed areas caused by over-illumination	Lower ambient light levels to 200-500 lux (20-50 fc) and use task lights
	Shiny, low-contrast, or small-print documents	Improve lighting on documents if documents cannot be changed



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Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
Air/ Ventilation	Air conditioners or heaters that directly blow air on users	Redirect the flow of air Avoid placing desks, chairs, and other work positions underneath vents
	Eyes tend to dry easily, especially of those people wearing contact lenses	Relative humidity of the air should be maintained between 30% and 60%
	Air circulation is poor, resulting in stuffy or stagnant conditions	Keep airflow rates within 3" and 6" per second (7.5cm and 15cm per second)
	Comfort and hence the productivity is affected because temperatures are above or below standard comfort levels	During the hot season, try to maintain the ambient indoor temperature between 68° and 74° F (20° and 23.5° C). During the cold season, the recommended temperature is between 73° and 78° F (23° and 26° C)
Manual Material Handling	Lifting and carrying heavy objects	Whenever practical use mechanical assistance (e.g. hoists, carts and forklifts) When it is necessary to lift objects that are too heavy or too awkward for a single person have a second person to assist Wear protective clothing for routine lifting or when items are moved on a cart Safety shoes and gloves should normally be used (safety shoes will protect feet if something drops or from accidental contact with cart wheels; gloves will improve grip) Habit training
	Moving objects to distant locations	Use carts Push rather than pull carts Keep back straight at all times Face the direction of travel when possible Habit training



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Things to look for		Possible solutions (depending on testing at the workplace & further analysis)
Repetitive work	Repetitive motions performed for several hours without break or repeated finger force required	Ensure tools are suitable for the task Present work items differently Implement job rotation
	Working too fast	Remove or monitor piecework schemes
Contact stress	Tools, equipment and/or work surface present sharp edges	Tools should not present hard/sharp edges or abrupt curves on the handle that could press into the user's hand or body Avoid ridges or channels for individual fingers Hard edges that press into the hand, wrist or elbow over a period can cause a number of MSDs to the hand or arm
Hand-arm vibration	Working with power-driven tools	Use the right tool for the job Making do with the wrong tool can mean more vibration, tighter hand grip, or longer tool use Avoid long periods of tools use without a break — short bursts of activity with mini-breaks are better Keep tools and machines in good working order — badly maintained or repaired tools may produce more vibration
Whole body vibration	Driving vehicles or operating machines that vibrate	Ensure that vehicles and machinery are adequately maintained, particularly suspension components Check the driver's seat to ensure it is in good repair, and gives good support Check whether a suspension seat is fitted that is suitable to the vibration characteristics of the machine and, if not, whether a suitable seat can be fitted If a suspension seat is fitted, ensure it is correctly adjusted to the operator's weight according to the



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Things to look for	Possible solutions (depending on testing at the workplace & further analysis)
	<p>manufacturer's instructions (some seats adjust automatically for driver weight)</p> <p>Ensure that where equipment in vehicle cabs can be adjusted, it is set to suit the size and reach of drivers expected to use it</p> <p>Choose the right vehicle or machine for the ground surface and task</p> <p>Check that vehicles have the right tyres and that they are inflated to the correct pressure for the ground surface</p> <p>Identify the vehicles or machines and work situations with the highest levels of vibration and arrange a rotation for operators or drivers to reduce the time spent on them by individuals</p> <p>Plan work site routes with the smoothest terrain</p> <p>If possible, improve the ground surface over which vehicles have to be driven regularly, for example by repairing pot-holes, clearing debris, or levelling it out</p>