

ERGONOMIC HAZARDS

Biomechanical hazards

Table of contents

1. INTRODUCTION	2
1.1. Background.....	2
1.2. Legal obligations.....	2
2. RISK PROFILE	2
2.1. Overview	2
2.2. Health effects.....	3
2.3. Modulators and risk factors.....	3
2.4. Legislation and best practices.....	4
3. SECTORS OF ACTIVITY OR TASKS WHERE A RISK OF EXPOSURE IS POSSIBLE	4
4. PREVENTION APPROACH.....	5
4.1. Identify and analyze risks.....	5
4.2. Correct risks	6
4.3. Control	8
5. SERVICES OFFERED BY RSPSAT TEAMS	10
6. SERVICES OFFERED BY OTHER PARTNERS	11
7. FOR MORE INFORMATION	11
TOOL FOR IDENTIFYING HIGH-RISK WORK SITUATIONS	12

This is a translation of the original French version available at: [Programmes de santé au travail pour les établissements / Commission des normes de l'équité de la santé et de la sécurité du travail - CNESST](#). In the event of any discrepancy or inconsistency between the French and English versions, the French version shall prevail.

1. INTRODUCTION

1.1. Background

Many workers face biomechanical hazards in their work setting. These can include awkward postures, physical exertion and repetitive movements. These risks can often lead to the development of work-related musculoskeletal disorders (MSDs). In 2021, injuries attributable to MSDs accounted for almost a third of all occupational injuries reported to and accepted by the CNESST. They also generated more than 2.4 million paid days of work absence.

1.2. Legal obligations

This occupational health program is developed in accordance with section 107 of the *Act respecting occupational health and safety* (AOHS). The employer is obliged to take this into account in its prevention program (AOHS, section 59) or action plan (AOHS, section 61.2). This document contains recommendations for the prevention of industrial accidents and occupational diseases to exposure to biomechanical hazards. In particular, it sets out the preventive measures to be implemented to protect the health of exposed workers. The employer must therefore determine which measure from the occupational health program should be considered and included in its prevention program or action plan. The aim is to manage the biomechanical hazards present in the workplace.

Section 61 of the AOHS provides that the CNESST may order an employer to transmit a prevention program or amend the content of the program in particular to ensure compliance with elements of the occupational health programs it has drawn up. Section 127(1) of the AOHS stipulates that the public health director may evaluate the health-related components of a prevention program or action plan and make recommendations to the employer, the CNESST and, where applicable, the health and safety committee.

The information presented in this health program provides general guidelines. To specify the preventive measures to be implemented in workplaces, it is recommended to consult the section [For more information](#) as well as the [Tool for identifying high-risk work situations](#). You can also contact an ergonomic specialist or the *Réseau de santé publique en santé au travail* (RSPSAT) team in your region.

2. RISK PROFILE

2.1. Overview

Biomechanical hazards are linked to the work environment, work organization or working conditions, and can cause physical or psychological strain on workers. These risks may be associated with:

- workstation design (e.g. inappropriate height of work surfaces)
- task organization (e.g. insufficient recovery periods or fast pace)
- the equipment used and how workers interact with their work environment (e.g. lack of training, poorly maintained equipment)

These situations require workers to adopt awkward postures, exert physical effort or perform repetitive movements that lead to the development of work-related musculoskeletal disorders (MSDs).

2.2. Health effects

MSDs refer to symptoms affecting soft tissues such as muscles, tendons and joints in various parts of the body (e.g. neck, back, arms or legs). Symptoms are progressive and can include discomfort, pain, numbness, muscle weakness and restriction of movement. Injuries generally occur when the job requirements exceed the body's ability to adapt. MSDs can have an impact on the activities of daily living (e.g. work-related or household activities, leisure activities). Symptoms may be temporary (a few days, months, years) or permanent.

Pregnant women may be more likely to develop MSDs, and some biomechanical hazards may have effects on the fetus or pregnancy. For these reasons, please refer to the [For a Safe Maternity Experience](#) (FSME) program.

Work performed by children¹ raises particular concerns with respect to biomechanical hazards, as they are still growing. As a result, their musculoskeletal system, vision and motor coordination may not be suited to certain work tasks. Other groups of workers may also be in high-risk work situations, without access to adequate preventive measures (e.g. individuals with an immigrant background).

2.3. Modulators and risk factors

The probability of developing an MSD varies according to three risk exposure modulators: duration, intensity and frequency.

In addition to the biomechanical hazards addressed in this document, there are other risks² that can contribute to the onset of MSDs, including:

- exposure to vibrations, shocks or impacts
- mechanical pressures
- working in the cold

¹ Refers to the [Act respecting the regulation of work by children](#). –

² The risk factors listed will not be addressed in this health program. It should be noted, however, that exposure to vibrations and cold will be covered by separate occupational health programs at a later date.

- exposure to noise³
- organizational constraints
- work-related psychosocial risks (PSR)⁴

Personal traits (e.g. sex and gender, age, medical history) and work history can also contribute.

2.4. Legislation and best practices

Every employer must take the necessary measures to protect the health and ensure the safety and physical and mental well-being of its workers. This obligation is defined in Section 51 of the *Act respecting occupational health and safety* (AOHS) and includes MSD-related preventive measures.

Specific ergonomic measures can be found in the *Regulation respecting occupational health and safety* (ROHS) at section XX.

In addition, for all other contexts and work situations, Canadian and international standards can serve as a reference. These standards are evidence-based and represent the recognized best practices in MSD prevention (see the section [Find out more](#)).

3. SECTORS OF ACTIVITY OR TASKS WHERE A RISK OF EXPOSURE IS POSSIBLE

Biomechanical hazards are present in all workplaces and concern all sectors of activity, professions and trades.

Examples of sectors: agriculture, fishing, hunting, forestry and mining; education; computing and robotics; service production; health; transportation and warehousing; arts, culture and recreation.

Examples of activities: production, manufacturing, processing; receiving, shipping, warehousing; maintenance and sanitation; transportation and delivery; inspection and audit.

These tasks can be performed outdoors (e.g. on the road, on the water, underground, in the forest) or indoors (e.g. care centres, stores, schools, factories, workshops, firms).

Telework can also expose workers to the biomechanical hazards. Section 5.1 of the *Act respecting occupational health and safety* (AOHS), which came into force on October 6, 2021, states that “subject to any incompatible provision [...] the provisions of [the AOHS] apply to a worker carrying on telework and to his employer.”

³Noise exposure risk is addressed in a separate occupational health program.

⁴Work-related psychosocial risks are addressed in a separate occupational health program.

4. PREVENTION APPROACH

4.1. Identify and analyze risks

As part of the process for identifying and analyzing biomechanical risk factors, work situations are assessed by the employer, the health and safety committee and the workers themselves. This collaboration is essential for understanding and analyzing high-risk work situations.

This health program provides a tool for identifying biomechanical hazards and is intended to guide workplaces in their prevention efforts.

The tool comprises series of statements and guidelines derived from ergonomics best practices in Quebec.⁵

It helps to identify high-risk work situations. It is not a comprehensive list of conditions that could lead to a musculoskeletal disorder (MSD). Due to the specific characteristics of each workplace, some statements may not apply.

4.1.1. Identify risks

To identify biomechanical risk factors, refer to the [Tool for identifying high-risk work situations](#).

Other tools can be used to identify biomechanical risk factors, including those listed in the section [For more information](#).

4.1.2. Analyze risks

Here are a few questions to help gauge the severity of the risk(s) you have identified. This will make it possible to **analyze risks and prioritize work situations** that require preventive action.

- Which tasks combine several high-risk situations?
- Are there one or more modulators increasing the exposure to risk?
 - **duration** (e.g. *maintaining a posture for 30 min versus 4 h, number of years of exposure*)
 - **intensity** (e.g. *lifting excessive weight, a very bent back*)
 - **frequency** (e.g. *number of times the risk is present in a day, highly repetitive movement*)
- What situations are currently affecting workers' health or productivity?
- How many workers are affected by these situations?

For more complex situations, we recommend consulting the section [For more information](#). You can also contact ergonomic specialists, such the *Réseau de santé publique en santé au travail* (RSPSAT) team in your region, who will be able to carry out a more in-depth assessment.

⁵ All guidelines provided in this tool come from ISO 11226, the ISO 11228 series of standards, WISHA and NIOSH. They serve as references for this health program and are recognized as ergonomic best practices in Quebec.

4.2. Correct risks

Once the risks have been identified and analyzed, preventive measures must be put in place to improve the problematic work situations. This approach must follow the hierarchy of controls. Therefore, it is necessary to check whether the risk can be eliminated at the source before opting for measures to mitigate it.

Elimination can take place when designing tasks and workstations, or when reviewing them. Often **several preventive measures need to be combined** to correct constraining work situations and prevent health effects.

The workplace is responsible for **ensuring that the preventive measures chosen do not create new risks or increase existing risks.**

At this stage, it is important to engage workers in defining the potential solutions to be prioritized. Here is the hierarchy of controls (from the most effective to the least effective) with a few examples:

4.2.1. Elimination at the source or substitution

This measure involves removing, substituting or modifying components that pose a biomechanical risk to exposed workers. For instance, it means assessing the possibility of:

- robotizing, automating or mechanizing high-risk or demanding tasks (e.g. bringing in packaging machines, extendable or portable conveyors or palletizers)
- designing workstations according to the work activity and workers' characteristics
- designing or acquiring tools adapted to tasks and workers
- reviewing identified risks when major or sudden changes occur

4.2.2. Engineering control

These measures reduce risk by limiting exposure. For instance, it means assessing the possibility of:

- providing adapted equipment for handling or transporting objects (e.g. overhead cranes, forklifts, hoists, suction systems, hand trucks)
- adapting workstations to workers and the tasks to be performed (e.g. shorten distances to be covered, provide adjustable work surfaces, avoid working at arm's length or bent over)
- maintaining and clearing spaces to facilitate movement and access to equipment and materials
- repairing damage and defects reported by workers
- providing tools and equipment that are in good condition, maintained, comfortable and that require little physical effort
- carrying out ergonomic studies in collaboration with workers to identify preventive measures and potential solutions (with an internal or external specialist)

4.2.3. Awareness-raising

This control is aimed at introducing technical signals to highlight risks and thus increase workers' ability to detect them and exercise caution. These signals can take various forms: technology, visual or audible alarms, panels, signage, etc. To this end, it bears assessing the possibility of using:

- posters, to remind workers of the biomechanical hazards present
- pictograms, to remind workers of ergonomic best practices
- displays, to inform workers of the ergonomic equipment available and its location
- alarms, reminding workers of breaks or shift rotations (audible alarms or IT application)

4.2.4. Administrative controls

These are methods or approaches that improve workers' ability to perform their tasks while limiting their exposure to risks. Here are a few examples.

- Develop and implement appropriate, safe and effective procedures, including worker training and supervision.
- Train staff on hazards present in the workplace, practices adapted to work situations, preventive measures, equipment use, etc.
- Raise workers' awareness of health effects and encourage them to report any problematic situations (e.g. discomfort, pain, broken or worn equipment).
- Adjust production expectations according to the labour available (variation based on absences and departures).
- Develop and implement work organization policies that limit the harmful effects on health (e.g. introduce effective job rotation to vary the type of effort and better balance work and rest periods, depending on the tasks performed).

4.2.5. Personal and collective protective equipment

This measure of last resort refers to what workers wear on their person. It should only be implemented if the preceding measures are not sufficient to ensure their protection. Wearing this equipment must be combined with another measure, including the following:

- Provide means of individual and collective protection adapted to the user, the task and work context.*
- Ensure that individual and collective protective equipment is used, maintained and stored properly.

**It should be noted that the use of poorly chosen personal protective equipment (e.g. one-size-fits-all gloves) can increase risks or create new ones.*

4.3. Control

Monitoring, assessment, maintenance and follow-up measures must be put in place to ensure that identified risks remain eliminated or corrected. The workplace is responsible for ensuring that preventive measures remain effective and in place permanently. Here are 10 control measures recommended by the CNESST:

4.3.1. Information

- Regularly inform workers of any modifications or changes in the workplace (e.g. include an information update and discussion period about occupational health and safety on meeting agendas).
- Ensure that measures involving biomechanical hazards are understood, integrated and applied.

4.3.2. Training and retraining

- Comply with the training plan designed for each position and function, and provide training reminders.
- Regularly update theoretical and practical training content.
- Implement mechanisms to ensure that the required training has been completed prior to the performance of tasks, including those carried out by new hires.
- Keep a record of training completed.

4.3.3. Inspection

- Introduce a procedure for inspecting sites, workstations, equipment, and tools.
- Determine the frequency of these inspections which, at a minimum, should be according to the manufacturer's recommendations.
- Keep a record of inspections.

4.3.4. Supervision

- Establish, implement and maintain processes to monitor and manage workstations, work methods, equipment, products, etc.
- Appoint a person responsible for implementing these processes.
- Increase supervision when it comes to new corrective measures, new tasks, new equipment and tools, or new hires.
- Keep a record of audits.

4.3.5. Preventive maintenance

- Implement a preventive maintenance program for equipment, facilities and sites, complying with the manufacturer's recommendations at a minimum.
- Keep a record of preventive maintenance performed.

4.3.6. Purchasing policy

- Develop and implement a purchasing policy that includes requirements relating to the prevention of biomechanical hazards (e.g. adjustable furniture, reduced weight of equipment and tools).

4.3.7. Subcontracting policy

- Incorporate biomechanical hazard reduction requirements into contracts governing subcontracted work.
- Implement a subcontractor monitoring system to ensure that they comply with these requirements.

4.3.8. Engineering policy

- Integrate ergonomic principles into all stages of a project or call for tenders. The aim is to adapt work to the individual so that they can perform tasks safely, comfortably and efficiently (e.g. from workstation design to furniture and equipment choices up developing the work method for that position).

4.3.9. Monitor workplace quality

- Implement a register of corrective measures to facilitate assessment and follow-up.
- Implement mechanisms to flag high-risk situations (e.g. frequent visits to workstations).

4.3.10. Monitor workers' health

- Analyze accident, incident and complaint records on a regular basis to highlight tasks or positions regularly associated with the onset of musculoskeletal disorders (MSDs).

5. SERVICES OFFERED BY RSPSAT TEAMS

The Réseau de santé publique en santé au travail (RSPSAT), together with its partners and in accordance with its legal mandates under the *Act respecting occupational health and safety* (AOHS), the *Public Health Act* (PHA) and the *Act respecting health services and social services* (AHSSS), works to prevent and protect workers' health by supporting workplaces in meeting their obligations to prevent occupational illness. The RSPSAT has multidisciplinary teams (doctors, nursing staff, occupational hygiene and ergonomics experts, psychosocial risk workers, etc.) with expertise in occupational health that are entirely funded by the Fonds de la santé et de la sécurité du travail. It has been offering its services free of charge throughout Quebec since the adoption of the AOHS in 1979.

More specifically, with regard to biomechanical risks, the RSPSAT can:

- support workplaces in identifying high-risk work situations
- help assess and prioritize jobs and tasks to be modified to reduce risks
- support workplaces in implementing control and preventive measures to eliminate or reduce risks and avoid generating new ones
- help assess the effectiveness of preventive measures put in place, and ensure that new risks are avoided
- offer information sessions on the health effects of biomechanical hazards, risk factors for musculoskeletal disorders (MSDs) and preventive measures so as to raise awareness among workers and employers
- encourage the participation of employers and workers in the biomechanical hazard management process

To request support or find out more about the services offered by the occupational health teams, consult the section [For more information](#) as well as www.santeautravail.qc.ca.

6. SERVICES OFFERED BY OTHER PARTNERS

Other [CNESST partners](#) help support workplaces in their occupational health and safety management efforts in many ways. The [joint sector-based associations](#) (JSAs) provide their members with services:

- advice and personalized assistance
- training and information

If you're linked to a JSA, you can find out about the specific services it offers its members.

7. FOR MORE INFORMATION

The [Institut de recherche Robert-Sauvé en santé et en sécurité du travail](#) (IRSST) contributes to worker health and safety of workers through research, the expertise of its laboratories, and the dissemination and transfer of knowledge, with a view to prevention and sustainable return to work. Tools and publications from research and knowledge mobilization projects are posted on its various platforms. You can consult them here:

The prevention of musculoskeletal disorders (MSDs) is a public health priority in Quebec. The **Institut national de santé publique du Québec (INSPQ)**, which has a scientific group dedicated to work-related MSDs, has published, in French only, [several documents and guides on the prevention of MSDs](#) and on the return to work of people with MSDs and their continued employment.

The CNESST informs clients on [preventing ergonomic risks and MSDs](#) (in French only), in addition to offering several information, prevention and support documents on the topic. You can consult them here:

If you have any questions, you can contact the CNESST by phone (1-844-838-0808) or through [MonEspace CNESST](#).

The **Réseau de santé publique en santé au travail (RSPSAT)** offers various tools addressing the [prevention of MSD risks](#) (in French only).

The **joint sector-based associations (ASP)** offer various tools concerning ergonomic risks. Here are a few:

- APSAM. [Ergonomic risks](#), (in French only) [Online], 2024.
- APSSAP. [Ergonomics and preventing MSDs](#), (in French only) [Online], 2024.
- ASSTSAS. [Theme folders](#), (in French only) [Online], 2024.
- MULTI PRÉVENTION. [Musculoskeletal disorders](#), (in French only) [Online], 2024.
- VIA PRÉVENTION. [Ergonomics and manual handling](#), (in French only) [Online], 2024.

The CNESST and the MSSS would like to thank the following partners for their participation in the development of occupational health programs:



ASSOCIATIONS
SECTORIELLES
PARITAIRES

Institut national
de santé publique

Québec



Réseau de santé publique
en santé au travail

Québec



Santé Québec

For general information, [contact the CNESST](#).

TOOL FOR IDENTIFYING HIGH-RISK WORK SITUATIONS

Illustrations: Michel Rouleau

This tool is used to identify the biomechanical risk factors in your environment and which could lead to musculoskeletal disorders (MSDs). It helps to identify the most critical high-risk situations (task, activity, workstation and environment) that could require the implementation of preventive measures.

The tool comprises series of statements and guidelines derived from ergonomics best practices in Quebec.⁶ It is not a comprehensive list of conditions that could lead to an MSD. Some statements may not apply due to the specific characteristics of individual work environments.

The tool can be used in any workplace, and requires no special skills or prior training. Identifying high-risk situations requires information gathering from workers and conducting observations in the field.

Following this identification, to estimate and prioritize high-risk situations, please continue the process by referring to the Health program in the Risk analysis section.

A. ARE THERE WORK SITUATIONS INVOLVING REPORTS OF:

- ☐ Work-related pain, discomfort, unease, or injury?
- ☐ Difficulties or complaints related to MSDs, any staff turnover, etc.?
- ☐ The presence of risk factors (awkward or static postures, repetitive movements, exertion, etc.)?
- ☐ Suggestions for improving the prevention of MSDs?

B. DO THE FOLLOWING RECORDS HAVE INFORMATION ASSOCIATED WITH MSDs?

- ☐ Accidents, incidents and first aid?
- ☐ Statistics on absences by sector or by position?
- ☐ Employer's notice and reimbursement claim forms?

⁶All guidelines provided in this tool come from ISO 11226, the ISO 11228 series of standards, WISHA and NIOSH. They serve as references for this health program and are recognized as ergonomic best practices in Quebec.

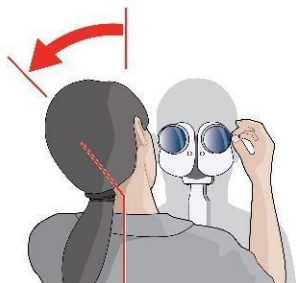
C. HAVE THE FOLLOWING HIGH-RISK SITUATIONS BEEN OBSERVED?

AWKWARD POSTURES

☐	<p>1. Standing in the same position for an extended period of time. <i>Example: Operating equipment from a standing position (machinist).</i></p>
☐	<p>2. Prolonged sitting without being able to change position. <i>Example: Working dispatch while seated for a long period of time (dispatcher).</i></p>
☐	<p>3. Twisting the head (rotation) in a significant, frequent or sustained manner. <i>Example: Turning one's head to reverse a forklift (forklift operator).</i></p>
☐	<p>4. Tilting the head forward (flexion) in a significant, frequent or sustained manner. <i>Examples: Tilting one's head forward to butcher meat on a low work surface (butcher). Keeping one's head in a tilted position to draw.</i></p>
☐	<p>5. Tilting the head backward (extension) in a significant, frequent or sustained manner. <i>Examples: Watching a crane operator's manoeuvres high up (site supervisor). Watching a screen positioned high up.</i></p>



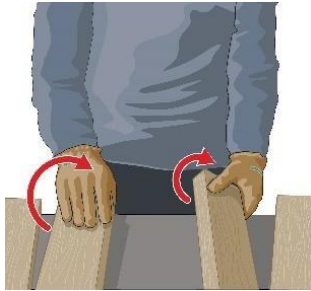
AWKWARD POSTURES

□	<p>6. Tilting the head to one side (<i>lateral flexion</i>) in a significant, frequent or sustained manner. <i>Example: Conducting an eye examination (optometrist).</i></p>	
□	<p>7. Twisting the back (<i>rotation</i>) in a significant, frequent or sustained manner. <i>Examples: Twisting without moving the legs to place vegetables in baskets (market gardener). Twisting without moving the feet to grasp an object.</i></p>	
□	<p>8. Bending forward (<i>flexion</i>) in a significant, frequent or sustained manner. <i>Example: Planting trees for reforestation (forester).</i></p>	
□	<p>9. Bending backward (<i>extension</i>) in a significant, frequent or sustained manner. <i>Example: Applying plaster to a ceiling (plasterer).</i></p>	
□	<p>10. Bending sideways (<i>lateral flexion</i>) in a significant, frequent or sustained manner. <i>Example: Looking outside the cab when operating rolling equipment (machinery operator).</i></p>	

AWKWARD POSTURES

□	<p>11. Raising the elbows above the shoulders. <i>Examples: Working under a vehicle to repair it (mechanic). Installing parts with arms above the head.</i></p>	
□	<p>12. Raising the elbows above the chest without support. <i>Examples: Hanging chickens on a production line (gambrel operator). Cutting branches high up.</i></p>	
□	<p>13. Raising (shrugging) the shoulders frequently or continuously. <i>Examples: Using a sewing machine (sewer). Working on a surface that's too high.</i></p>	
□	<p>14. Turning shoulder inward (internal rotation of the shoulder). <i>Examples: Packing cases with boxes of cookies (case packer). Packing items into a grocery bag.</i></p>	
□	<p>15. Turning the shoulder outward (external rotation of the shoulder). <i>Examples: Sorting material by placing products in a bin positioned to the side toward the back (sorter). Reaching backward for an object on a conveyor without moving the body.</i></p>	

AWKWARD POSTURES

☐	<p>16. Working at arm's length forward or to the side (<i>shoulder flexion or abduction</i>).</p> <p><i>Examples: Filling a dispenser at arm's length (production operator).</i></p> <p><i>Stretching to grasp objects out of reach.</i></p>	
☐	<p>17. Fully turning (rotation) the forearm with palm upward or downward (<i>supination - pronation</i>) frequently or for a prolonged period.</p> <p><i>Examples: Turning boards on a production line for quality control (day labourer in a sawmill).</i></p> <p><i>Using a screwdriver to assemble furniture.</i></p>	
☐	<p>18. Turning (rotation) the forearm with the palm downward (<i>pronation</i>) frequently or for a prolonged period.</p> <p><i>Examples: Cleaning surfaces (maintenance worker).</i></p> <p><i>Using a computer mouse.</i></p>	
☐	<p>19. Turning (rotation) the forearm with the palm upward (<i>supination</i>) frequently or for a prolonged period.</p> <p><i>Example: Picking tomatoes on the vine (harvester).</i></p>	
☐	<p>20. Bending the wrist upward (<i>extension</i>) in a pronounced or sustained manner.</p> <p><i>Example: Holding a boom for sound recording (sound engineer).</i></p>	
☐	<p>21. Bending the wrist downward (<i>flexion</i>) in a pronounced or sustained manner.</p> <p><i>Example: Cutting hair and holding a comb (hairdresser).</i></p>	

AWKWARD POSTURES



- 22. Pivoting the wrist outward (*ulnar flexion*) in a pronounced or sustained manner.**
Example: Cutting in with a paintbrush (house painter).



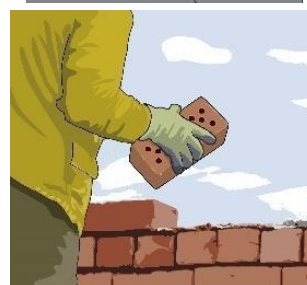
- 23. Pivoting the wrist inward (*radial flexion*) in a pronounced or sustained manner.**
Example: Dental cleaning (dental hygienist).



- 24. Grasping and handling an object by the fingertips with a pinched hand.**
Examples: Sorting products on a conveyor (quality control worker).
Working on electronic circuit boards.



- 25. Grasping, holding or squeezing a bulky object with fingers spread out or hooked.**
Examples: Gripping bricks (bricklayer).
Grabbing a gallon of paint by the handle.



- 26. Using the fingers to do precision work.**
Example: Making jewellery (jeweller).



AWKWARD POSTURES

☐	<p>27. Squatting frequently or for a prolonged period. <i>Examples: Installing a radiant floor heating system (plumber). Installing floating floors.</i></p>	
☐	<p>28. Kneeling frequently or for a prolonged period. <i>Example: Installing carpet over large surfaces (carpet layer).</i></p>	
☐	<p>29. Being on one foot frequently or for a prolonged period. <i>Example: Operating a foot pump (mechanic).</i></p>	
☐	<p>30. Being on tiptoes frequently or for a prolonged period. <i>Example: Grasping materials high up (material handler).</i></p>	

REPETITIVE MOVEMENTS

☐	<p>31. Repeating the same movement or a sequence of similar movements for more than 2 hours for an extended period without a break.¹ <i>Example: Sorting objects on a conveyor (sorting operator).</i></p> <p>¹ This statement does not apply to typing on a computer.</p>	
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EXERTION

☐	<p>32. Lifting or placing objects weighing more than 3 kg <u>above the shoulders</u>, more than 10 times/min for a duration of more than 2 hours.</p> <p><i>Examples: Storing tires high up on racks (warehouse attendant).</i></p> <p><i>Storing archive boxes on high shelves.</i></p>
☐	<p>33. Lifting or placing objects weighing more than 3 kg <u>below the knees</u>, more than 10 times/min for a duration of more than 2 hours.</p> <p><i>Example: Delivering goods (deliveryman).</i></p>
☐	<p>34. Lifting or placing objects weighing more than 3 kg <u>at arm's reach</u>, more than 10 times/min for a duration of more than 2 hours.</p> <p><i>Example: Placing crates on a pallet (handler).</i></p>
☐	<p>35. Lifting or placing objects weighing more than 10 kg.</p> <p><i>Examples: Delivering kegs of beer (deliveryman).</i></p> <p><i>Placing bags of litter, soil or salt on shelves.</i></p>
☐	<p>36. Moving an object with one hand or at arm's length.</p> <p><i>Example: Scanning items at a cash register (cashier).</i></p>



EXERTION

☐	<p>37. Grasping an object weighing more than 1 kg by the fingertips with a pinched hand. <i>Examples: Placing cans in boxes (box packer). Removing large documents from a filing cabinet.</i></p>	
☐	<p>38. Grasping an object weighing more than 4.5 kg with one hand. <i>Examples: Manually delivering 20 litre water bottles (delivery person). Grabbing a gallon of paint.</i></p>	
☐	<p>39. Pushing or pulling equipment with hands placed higher than shoulder height or wider than shoulder width. <i>Example: Pushing a meal cart (food service attendant).</i></p>	
☐	<p>40. Pushing or pulling equipment with the back bent significantly (flexion). <i>Examples: Pushing a wheeled bin that's full (processor). Pushing multiple grocery carts.</i></p>	
☐	<p>41. Pushing or pulling equipment with the back turned significantly (rotation). <i>Example: Pulling a pallet jack while looking backward (warehouse handler).</i></p>	

EXERTION

- ☐ 42. Exceeding the cumulative weight limit when lifting or depositing loads, for a given time: ¹
- 2,500 kg or more over a 1-hour period.
 - 5,000 kg or more over a 4-hour period.
 - 6,000 kg over an 8-hour period.
- Example: Handling trash bags (trash collector).*

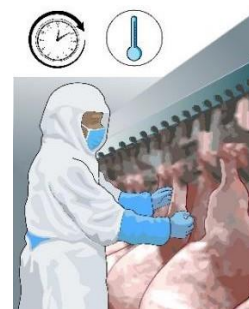
¹ Reference: standard ISO 11228-1:2021

- ☐ 43. Exceeding the cumulative weight limit when lifting or depositing loads:
- 4,800 kg or more over a distance of less than 5 m.
 - 3,600 kg or more over a distance of 5 to 10 m.
- Example: Moving material all day (mover).*



AGGRAVATING CONDITION - EXERTION

- ☐ 44. Being exposed to cold ambient temperatures.
Example: Butchering meat in a refrigerated area.



- ☐ 45. Being exposed to hot objects (about 35 °C) that are hard to hold.
Example: Taking baked goods out of an oven (baker).



- ☐ 46. Being exposed to cold objects (about 15 °C) that are hard to hold.
Example: Sorting fish in an ice-filled bin (fish sorter).



AGGRAVATING CONDITION - EXERTION

☐	<p>47.Using equipment or tools that are damaged, poorly maintained or unsuitable for the job. <i>Example: Using a forklift with a defective and damaged wheel (material handler).</i></p>	
☐	<p>48.Being exposed to slippery, uneven, unstable, sloping or congested flooring or ground. <i>Example: Cleaning and disinfecting work surfaces (sanitation attendant).</i></p>	
☐	<p>49. Working on a ladder or stepladder. <i>Example: Handling a load on a stepladder.</i></p>	
☐	<p>50. Working in tight or problematic spaces that call for extra effort. <i>Example: Handling boxes in a confined space (clerk).</i></p>	
☐	<p>51.Working with objects whose shape or size reduces the field of vision, or restricts grip or movement. <i>Example: Moving very large furniture (mover).</i></p>	