



# Safety & Health Toolbox

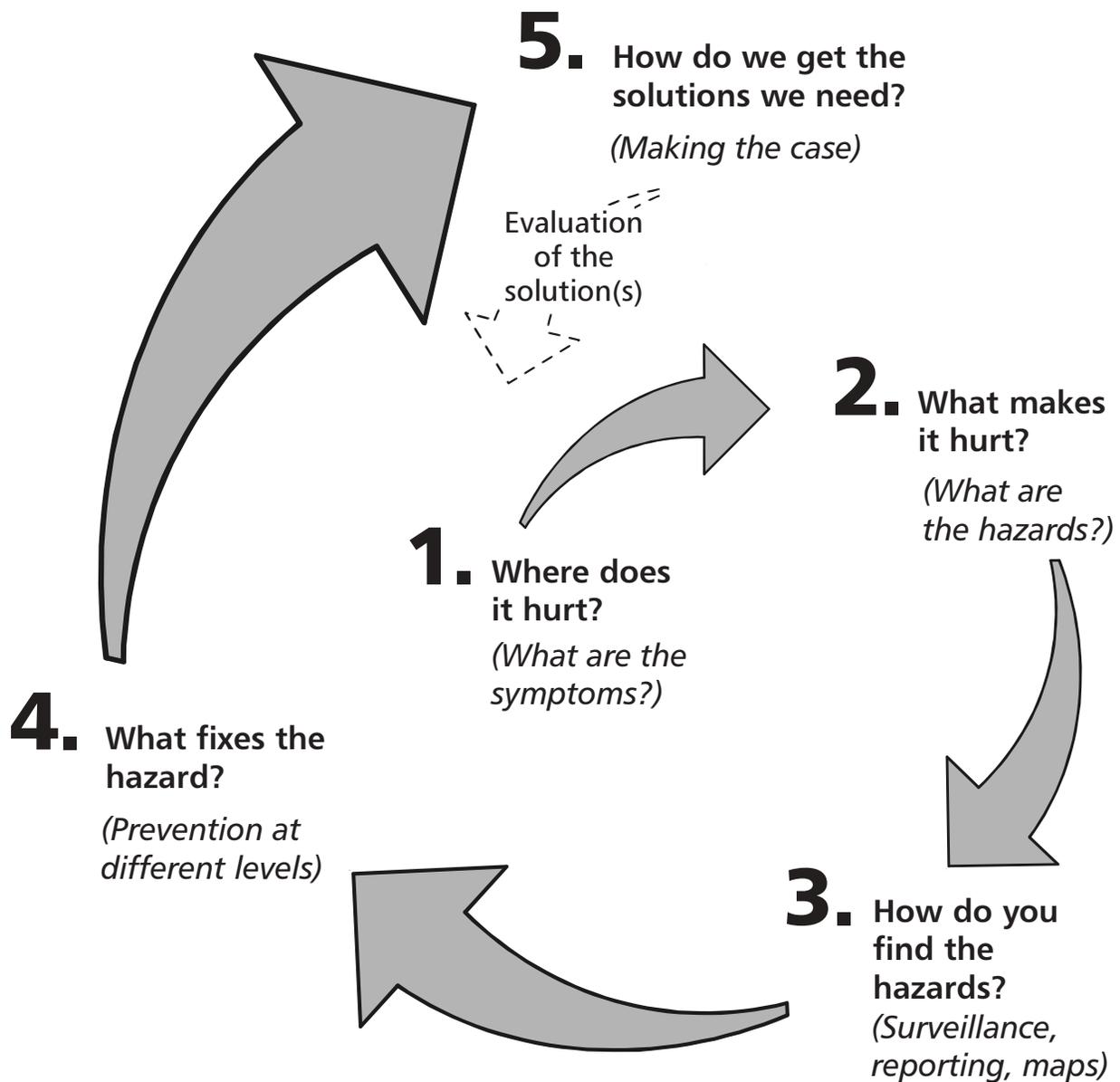
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(A screening checklist adapted from the SOBANE method)
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(An observation checklist adapted from the SOBANE method)
 

1. Computer or monitor work	13. Force - wrist and hand strain
2. Tools, materials, controls, products	14. Force - pushing, pulling with the arms
3. Tools	15. Force - lifting: characteristics of the load
4. Work station - obstructions	16. Force - lifting: starting position
5. Posture - sitting	17. Force - lifting: moving the object
6. Posture - standing	18. Force - lifting: frequency and weight
7. Posture - neck, shoulders	19. Work environment - general
8. Posture - elbows, forearms, wrists, hands	20. Work environment - lighting
9. Posture - other positions/postures	21. Work organization/stressors - time issues
10. Repetition	22. Work organization/stressors - other hazards
11. Force - manual materials handling equipment	23. Summary of observations
12. Force - vibrating tools	
- SH.11 Incident investigation report form
- SH.12 Mapping tools to see the workplace with "new eyes", supplemented by:
  - Where does it hurt? - Body map outline
  - Hazard categories for mapping
- SH.13 Prevention triangle
- SH.14 Workplace stressors have toxic effects





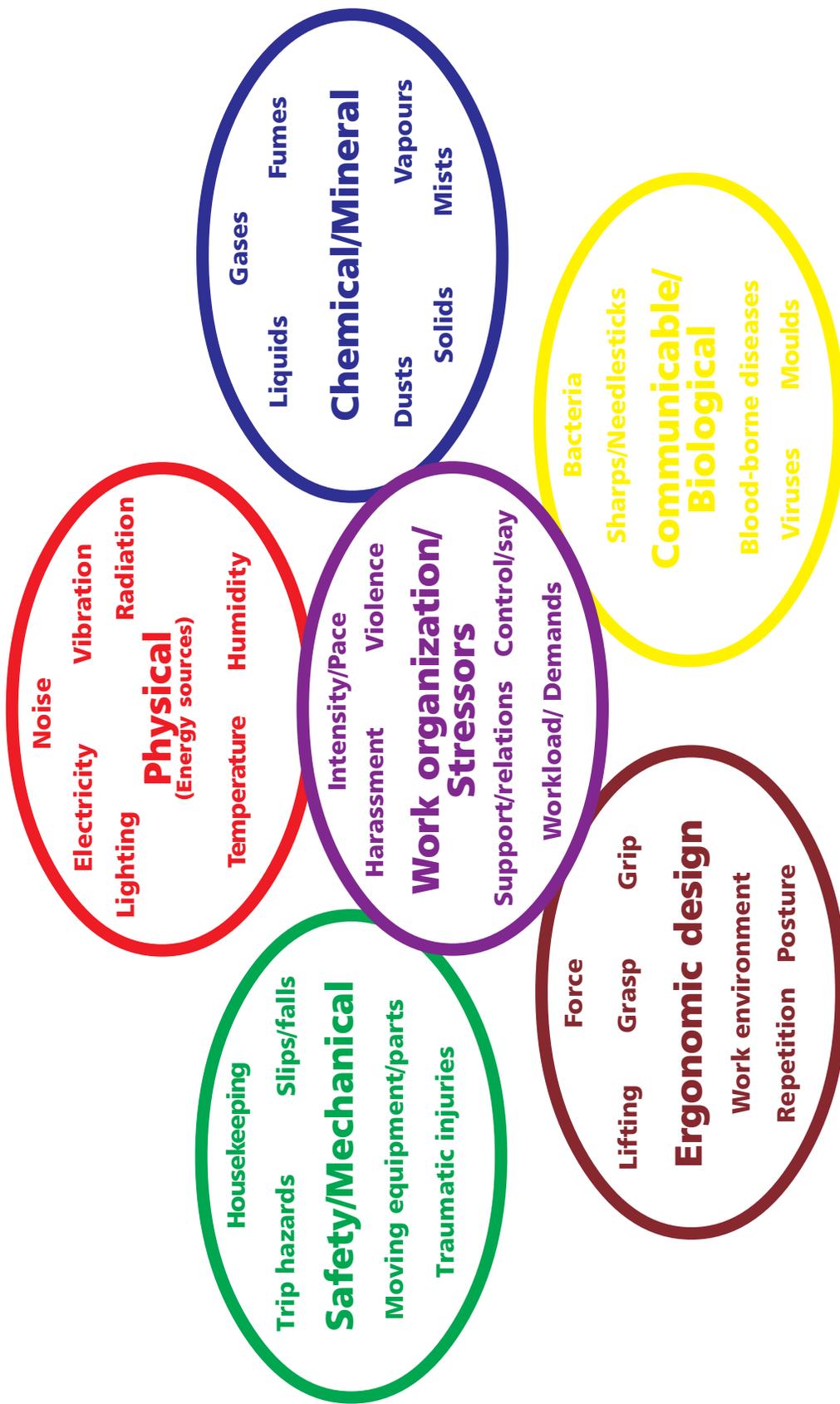
## Five steps to a healthy and safe workplace







# Hazards - the problems behind our symptoms



# Hazard categories

**Chemical** hazards include: gases, liquids and solids, and the things into which they can be changed. Note that vapours are the gaseous form of liquids, and fumes are very small, airborne, solid particles formed by the cooling of a very hot vapour. Smaller than dusts, fumes are more easily breathed into the lungs. Therefore there are paint vapours and welding fumes. It matters when you use respirators or design ventilation systems.

**Communicable/Biological** hazards aren't just found in hospitals or personal care homes. They're the "bugs" we have to deal with when we come in contact with others, moulds, sharps (also found in other jobs than health care), etc.

**Ergonomic design** hazards, sometimes called biomechanical hazards, involve problems with the design and organisation of work. Ergonomics can be defined as the "law of work", in which the key is to *fit the job to the worker, not the other way around*. It's about how much people are expected to do with their bodies and brains; as a Canadian ergonomist says, workers are expected to do things on the job that robots do not do.

These hazards usually affect our musculoskeletal system - they cause aches and pains. However, they also include such things as the design of equipment controls or operating systems. So there also can be effects on our ability to see, concentrate, use operating equipment/computers, etc. Some ergonomic hazards are considered physical hazards in other circumstances.

**Physical** hazards are not the physical symptoms of an illness or injury or something that is visible. They are hazards from energy sources. Compare them with safety/mechanical hazards. This category includes the hazards associated with indoor air problems.

**Safety/Mechanical** hazards are the slip, trip, fall type of hazards. They include machinery with moving parts. They are not physical hazards.

**Work organization** hazards or **stressors** cause us stress (short-term effects) and strain (long-term or chronic effects). They are related to how much we have about any part of our work, how hard we work, how much we have to do (workload), what kind of social relationships there are at work, what kinds of rewards we get for our efforts, the threat of violence, lack of respect, etc.





# Inspections - how to do them

## The general approach: What the HEC is going on?

**Inspections** are an essential tool to prevent injuries, illnesses and diseases. **Investigations** are a specialized type of inspection, usually after something has happened. They are both part of a program and a way to evaluate it.

Whether it's an inspection or investigation, looking at the workplace for hazards involves being a detective to find out *what the HEC is going on*:

- Is there a **H**azard?
  - look at the workplace for hazards by category (See SH.2)
- Is there an **E**xposure?
  - rate the hazards for the likelihood people are exposed to them ie. can people be affected by the hazard? can the hazard get into the body by at least one route of entry?
  - what is supposed to prevent or reduce the exposure?
  - how well is it working?
- What are the **C**onsequences?
  - who could be exposed ?
  - how often are they exposed?
  - for how long?
  - how much are they exposed to?
  - what effects are possible (acute and chronic)?

The HEC sheet is very general, but it provides a useful framework for your inspections. It can be adapted with more specific categories and items or colour-coded to help you keep track of the hazard categories.

The first page is best used during an inspection. Before doing one, you can fill in the items for which you want to look for specifically, or just some things to look for in general.

**Inspections - what the HEC\* is going on?**

Choose the hazard category for which you are using this sheet, write that on the line in the second column. Use page one to list the hazards found. Use the second page to jot down ideas about priorities, possible solutions and, if it's a quick fix, who's to do what by when.

Date: \_\_\_\_\_ Work area: \_\_\_\_\_ Done by: \_\_\_\_\_

Item #	What are the Hazards?	What are the Exposures?			What are the Consequences?			
		Is exposure possible?	What prevention/control measures are there supposed to be?	How well are they working?	Who can be exposed?	How often?	How much?	What is the possible effect?

\*HEC = Hazard/ Exposure/ Consequences

SAFE WORK

The second page can help you prepare your report and recommendations. Alternately, use the form to record the results of your inspection.

Item #	Problem/hazard	Priority	Action required		Who's involved?	Dates for change	Done & checked by
			Short term	Long term			

Workplace Inspections - What the HEC is going on?

See SH.5 for a blank form



## Preparation

Get together a “toolbox”. It should include:

- floor plans, block diagrams and work area descriptions
- inspection checklists and report forms
- list of things to look for (see below)
- list of people to whom you should talk (supervisors, union reps or members, worker/health and safety committee reps, specific workers)
- information from material safety data sheets (MSDSs), especially for things that:
  - are considered a carcinogen, allergen/sensitizer or reproductive toxin
  - have other serious chronic effects
- paper for notes and sketches
- clip board to carry paper & write on
- measuring tape
- tissue paper on a stick (to check the ventilation)
- camera
- personal protective equipment (PPE) you need for different work areas
- a card with your name, phone number and/or e-mail address to give to people who want to talk to you another time, etc.
- ... **and** something in which to carry these things without hurting your body.

The **list** of things to check out should be based on:

- people’s complaints
- incident or near-miss reports
- previous inspection reports and follow-up notes
- health and safety committee minutes
- reports from other people’s inspections or investigations (WSHD, consultants)
- anything else you think of

Plan your route beforehand. Ask about areas where you’ll need PPE or where you cannot take certain items because of static, etc. You might decide to ask specific questions based on the information you gather. It helps to write these down ahead of time.

## Doing the inspection

Be methodical and thorough. This is a useful sequence to use when you enter an area:

- look **around**: get in the habit of keeping to a system by starting from the left or right
- look **down**: check the floor and pits, etc.
- look **up**: check the ceiling, upper storage racks and cupboards, overhead fixtures, etc.
- look **inside**: storage cabinets, cupboards, storage rooms, etc.

Always check for MSDSs, labels and warning signs.

Do not operate equipment. If you need to see something in action, ask the operator to demonstrate. If the operator doesn’t know about possible hazards, this is a good indication there may be reason for concern.

Some hazards are difficult to see or assess with just your senses. Never taste anything or sniff at unknown vapours or gases.

Never ignore something because you don’t know how to accurately judge possible hazards. When in doubt, ask! If you want more information, go to your resources after the inspection.

Talk to workers and supervisors. Workers, in particular, deal directly with a task, machine or equipment, so their “take” on a situation is essential. Be aware that some people may not want to talk to you if the supervisor is within ear-shot or can see them. Or, they may have questions you can’t answer right away. Your card can be useful to give them for follow-up.

If you’re doing the inspection with someone else, two sets of eyes can be better than one. Decide how you’ll divide up the work. For example, each person could take two or three types of hazards on which they will concentrate.



Be prepared to recommend monitoring equipment if you think it's really needed. On the other hand, your tissue paper on a stick is a handy way to measure ventilation, especially if exhaust vents are in hard-to-reach places. If a place is noisy, you know it's above 85 decibels (dB) if you have to raise your voice to talk to someone one meter away.

## Writing things up and down

Use the HEC sheet or other inspection checklist you put together, along with the floor plan or drawings you make on the spot.

Don't rely on your memory. For each hazard:

- locate it
- give a clear description
- think about what difference it makes if the equipment or tool is being used or not, and if something is out of order, come back another time to see it working
- consider what happens when you're not there (e.g. maintenance, non-routine activities, different shifts) and ask questions to figure out if you should come back
- ask for suggestions about what would fix something or improve a situation

After looking at a possible hazard:

- figure out if the complaints or questions you get from people in the area, or the problems you see, are one-time events or happen often
- fill in the other parts of the HEC sheet under Exposure and Consequences
- rate the hazard in terms of whether or not
  - it could be prevented altogether
  - is adequately controlled now
  - there are inadequate or no prevention measures
  - you're not sure if prevention measures are needed or adequate
- write down your questions, observations and information from people in the area right away, in case you're interrupted
- note anything which hasn't been corrected

since the last time you or someone else looked at the situation

- take a picture or make a sketch if something's hard to describe or you want to back up your notes

## If you find problems

If something is an immediate hazard, talk to the worker(s), union steward (if there is one) and supervisor. Recommend the equipment, tool or task be stopped until changes are made. Include protective equipment that might allow work to continue for a short time until repairs are done. Make notes about what you said, and to whom.

If your recommendation is not followed, be prepared to call or talk to someone else in authority, as soon as possible. Be prepared with information about:

- what you found
- why you think it's a serious problem that needs to be fixed immediately
- what you recommended doing
- who you talked to
- what you said
- what the people you talked to said and did

For other hazards, talk to the worker(s) and supervisor about what you found, as soon as possible. Ask why something is the way it is, to better understand a situation. Ask for suggestions about how to fix a problem. (**Resist recommending solutions before you have all the information you need.**)

Be sure to tell them you'll have a written report done by a certain date. If you can, offer to return to discuss your report and recommendations.

Note things that are working well, or provide good examples of how to do something or deal with a hazard. You may want to keep a list of these good practices for discussions about how similar situations can be addressed.



## After the inspection

Don't make assumptions about why something is or isn't a hazard. If you didn't get enough information to make a decision, figure out what else you need to know. The best question you can always ask is: *why?*

If you did the inspection with others, debrief about what you saw, heard, etc.

Before recommending changes, consider:

- the *Prevention triangle* - how close are you to the source of the problem?
- short- and long-term solutions
- who's affected by the changes?
- what are the consequences of the changes?
- are new hazards created?
- what do(es) the worker(s) involved have to say?
- what does the supervisor have to say?
- what does the union say? (if there is one)

Write up your report. Include:

- problems fixed since the last inspection
- progress on problems found in earlier inspections
- reasons why they haven't been fixed yet
- new problems
- priorities and reasons for this assessment
- proposed solutions and strategies if you have helpful ideas (short- and long-term)
- steps needed to investigate something further
- recommended follow-up, including dates and people who are responsible for it

You can use the second part of the HEC checklist and *Healthy solutions for workplace hazards* chart (CP.10) to do this.

Present it to the committee, relevant supervisor(s), employer and health and safety staff.

Figure out what kind of follow-up is needed, the dates involved and who is responsible for what. Always get a record in the committee minutes about what's been done and needs to be done.

This has been adapted from the British Columbia Federation of Labour's "Occupational health and safety education project", Vancouver, 2002, with additional materials from Margaret Keith and others (2002) *Barefoot research*. Geneva: International Labour Organisation, and personal experience.





# Inspections - looking for all hazards

## Using the SOBANE screening approach\*

Workplace safety and health committee members must inspect their workplaces. Like many other activities, good inspections take time. It also takes time to learn how to do inspections.

For general guidance about the “how”, see **Inspections -- how to do them** (SH.3). Use it with this document as you learn the skills required.

This tool is designed to help you look for all the hazards in your workplace, by category. Using a screening approach, it lets you identify problems that require more information and detailed inspection or observations, while doing “quick fixes”. There are seven sections to this inspection tool; some have sub-topics:

1. **General working conditions**
2. **Safety/Mechanical hazards** (Traumatic injuries/incidents; Electricity, fire and explosions)
3. **Physical hazards** (Lighting; Noise; Temperature and humidity; Vibration)
4. **Chemical/Mineral hazards**
5. **Communicable/Biological hazards**
6. **Ergonomic design hazards** (Forms, controls and signals; Work materials, tools, machines; Repetition and postures; Force (including materials handling))
7. **Work organization hazards/stressors** (Work procedures; Autonomy and responsibilities; Work content; Time

constraints; Relationships between workers and with management; Social and general environment

If you need to get into more details about ergonomic hazards, see SH.10 in this manual. If you need to look at other hazards, see the *Resource Guide* for other materials available elsewhere (e.g. noise, indoor air, chemicals).

### Planning inspections with this tool

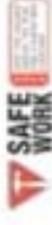
Don't be put off by the length of the document. It's designed to be thorough while the format makes it easy to read and use.

Start with a committee discussion about how to organise inspections. Set a deadline by which the whole workplace has to be done and work backwards from that to set time lines.

Always try to have two people work together. Members who are new to inspections could go with those who have more experience. Try to include one worker and one supervisor from each area that you inspect. Always plan on talking to people working in the areas you're inspecting.

Consider different ways to get through the entire workplace. Two-person teams can take one department and look for all hazards there. Teams can take one or two categories of hazards and look for those in the whole workplace.

SH.4



Make sure that committee members have time to do a proper inspection. If it takes longer than expected, individuals should talk with the co-chairs and/or their supervisors about how to get the time they need.

### How to use this inspection tool

Start with the hazard category in which you're interested. Decide if you want to look for all aspects of the category or for one of its sub-topics. The summary sheet at the back will help you choose.

Select the section of the inspection tool that you want to use. For each one, look at the columns about the general topic and what you should "consider".

The general topic about prevention measures may refer to a "level" of prevention. For more about these levels, see the Prevention triangle in this manual (SH.13) and *Part C Step 4: What fixes the hazards?*

This is a screening approach – to find out if you need to do more and/or if a quick fix is possible. There are three main answers:

-  **Green light (G):** the situation's is just fine
-  **Yellow light (Y):** the situation is average, fix if possible
-  **Red light (R):** unsatisfactory situation, may be dangerous and changes are needed

Circle the appropriate "light". If it's not "Green (G)", go to the next column to estimate what the problem costs. There are four



categories: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$). There's a reminder line about this at the bottom of each page.

When you think about costs, also consider the legal term "**reasonably practicable**". It is used in the *Act* and regulations, usually to describe employer's duties (things they must do). The idea is important when making the case for health and safety changes. It can be a legal reason to justify spending money.

The words mean there must be a big difference between what it costs to fix a hazard (in time, effort and money) and what it costs to leave it alone. Only then is it not "reasonably practicable" to fix the problem. The more serious the hazard, the bigger the difference has to be before nothing has to be done, legally.

The next step is to figure out what can be done right away for a "quick fix". Who will do it? What deadline is reasonable? What might it cost?

Finally, it's important to decide if you need to check out more about the situation or hazard. Do you need more time to look at how something functions? Is a longer-term solution needed? Need more information? If so, mark it down in the last column.

Use the **summary** at the end of the document to list what still needs to be done, by whom, etc.

\* This list is the result of adapting the Belgian SOBANE materials (see *Part F. Step 3: How do you find symptoms and hazards* in the manual) to the New Eyes approach. For the original SOBANE document in English, see [http://www.sobane.be/langues/eng/the\\_mother\\_guide\\_deparis4\\_2006.doc](http://www.sobane.be/langues/eng/the_mother_guide_deparis4_2006.doc).

# 1. General working conditions -- Premises and working areas

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Access to work areas	Easy, direct and wide enough (at least 80 cm/31.5 in.)?	😊 (G) 😐 (Y) 😞 (R)						
	Good visibility?	😊 (G) 😐 (Y) 😞 (R)						
Circulation paths (for people and vehicles)	Not obstructed with objects, boxes, pallets, etc.?	😊 (G) 😐 (Y) 😞 (R)						
	Well marked by lines?	😊 (G) 😐 (Y) 😞 (R)						
	Wide enough for people and vehicles?	😊 (G) 😐 (Y) 😞 (R)						
Emergency exits	Not obstructed?	😊 (G) 😐 (Y) 😞 (R)						
	Quite visible?	😊 (G) 😐 (Y) 😞 (R)						
	Signs have appropriate words and/or symbols?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Facilities/ "welfare"</b> (e.g. washrooms, changing areas, showers, cafeteria, etc.)	For women and men, where appropriate?	😊 (G) 😐 (Y) 😞 (R)						
	Right size?	😊 (G) 😐 (Y) 😞 (R)						
	Comfortable?	😊 (G) 😐 (Y) 😞 (R)						
	Well-equipped? Does it meet legal requirements?	😊 (G) 😐 (Y) 😞 (R)						
<b>Floors</b>	In good condition?	😊 (G) 😐 (Y) 😞 (R)						
	Level?	😊 (G) 😐 (Y) 😞 (R)						
	Not slippery?	😊 (G) 😐 (Y) 😞 (R)						
	Safe? (e.g. no tripping hazards)	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Obstructions	Appropriate storage procedures?	😊 (G) 😐 (Y) 😞 (R)						
	Is the area tidy?	😊 (G) 😐 (Y) 😞 (R)						
Storage spaces	Are there enough cupboards, spaces, etc.?	😊 (G) 😐 (Y) 😞 (R)						
	Are they easily accessible?	😊 (G) 😐 (Y) 😞 (R)						
Technical maintenance and housekeeping	Working areas well and regularly maintained and pleasant?	😊 (G) 😐 (Y) 😞 (R)						
	Enough containers, well located and appropriate?	😊 (G) 😐 (Y) 😞 (R)						
Waste/garbage/recycling	Sorted and taken out properly?	😊 (G) 😐 (Y) 😞 (R)						
	Is everything recycled that could and should be?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Therefore, the **overall situation** for **General working conditions** -- **Premises and working areas** is:



**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 2. Safety and mechanical -- Traumatic injuries/incidents

Topic	Consider	The situation is ...	If not 😊 (G), what's the <u>problem</u> cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Falls from heights	Fall protection system(s) (e.g. scaffolds, harness)?	😊 (G) 😐 (Y) 😞 (R)						
	Systems and equipment are checked regularly?	😊 (G) 😐 (Y) 😞 (R)						
	Systems and equipment is maintained?	😊 (G) 😐 (Y) 😞 (R)						
Falls on the ground	Floor in good condition?	😊 (G) 😐 (Y) 😞 (R)						
	Floor is tidy, no clutter?	😊 (G) 😐 (Y) 😞 (R)						
	Clean floor?	😊 (G) 😐 (Y) 😞 (R)						
Falling or projecting objects	Safety of the activities?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Falling or projecting objects (cont'd)	Tools and materials are stored properly?	😊 (G) 😞 (Y) 😞 (R)						
	Barriers, machine guards, pulley covers are present and used?	😊 (G) 😞 (Y) 😞 (R)						
	Needles or cutters used?	😊 (G) 😞 (Y) 😞 (R)						
Work clothes	Heat sources?	😊 (G) 😞 (Y) 😞 (R)						
	Available?	😊 (G) 😞 (Y) 😞 (R)						
	Appropriate?	😊 (G) 😞 (Y) 😞 (R)						
	Used?	😊 (G) 😞 (Y) 😞 (R)						
	Fit the workers using it/them?	😊 (G) 😞 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Work clothes (cont'd)	Maintained and cleaned?	😊 (G) 😐 (Y) 😞 (R)						
	Stored in appropriate place?	😊 (G) 😐 (Y) 😞 (R)						
Other prevention measures - level 3: personal protective equipment (PPE)	Are there respirators, safety glasses, and gloves, as needed?	😊 (G) 😐 (Y) 😞 (R)						
	For using machines: are there glasses, gloves?	😊 (G) 😐 (Y) 😞 (R)						
	For working at heights: safety harness, etc.?	😊 (G) 😐 (Y) 😞 (R)						
	Is it appropriate for the task and worker (e.g. fit)?	😊 (G) 😐 (Y) 😞 (R)						
	Is it stored in a clean space?	😊 (G) 😐 (Y) 😞 (R)						
	Is it maintained and checked regularly?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😐 (Y) or 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Other prevention measures - level 3: personal protective equipment (PPE) (cont'd)	Is it replaced when it doesn't work properly?	😊 (G) 😐 (Y) 😞 (R)						
	Is there a procedure to report these kinds of safety hazards?	😊 (G) 😐 (Y) 😞 (R)						
Reporting hazards	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						
	Systematic (i.e. thorough) and comprehensive (e.g. look for root causes)?	😊 (G) 😐 (Y) 😞 (R)						
	Known and understood?	😊 (G) 😐 (Y) 😞 (R)						
Incident investigation procedures	Are the form and the instructions clear?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Incident investigation procedures</b> (cont'd)	Used?	😊 (G) 😐 (Y) 😞 (R)						
<b>First aid</b> (first aid room, first aid kits, first aid staff or workers)	Well-located?	😊 (G) 😐 (Y) 😞 (R)						
<b>First aid</b> (first aid room, first aid kits, first aid staff or workers)	Appropriate?	😊 (G) 😐 (Y) 😞 (R)						
	People trained and upgraded regularly?	😊 (G) 😐 (Y) 😞 (R)						



Therefore, the **overall situation** for **Safety and mechanical** -- **traumatic injuries/incidents** is:

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 2. Safety and mechanical -- Electricity, fire and explosions

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Electricity	<b>The general wiring</b> -- circuit breakers, fuses, grounds, signs, etc.	😊 (G) 😐 (Y) 😞 (R)						
	<b>The material</b> -- wires, cables, extensions, grounding, etc.	😊 (G) 😐 (Y) 😞 (R)						
	<b>The equipment</b> -- connections, emergency stops, grounding, maintenance, insulation, batteries	😊 (G) 😐 (Y) 😞 (R)						
Fire and explosion	<b>Inflammable or explosive materials</b> -- quantity, storage, ventilation, supply	😊 (G) 😐 (Y) 😞 (R)						
	<b>Sources</b> -- flames, sparks or sources of heat (e.g. static electricity), signs	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Fire and explosion (cont'd)	<b>Fire fighting devices</b> -- automatic fire detection and extinguishers, other fire extinguishers, hose reels, hydrants, signs for them	😊 (G) 😐 (Y) 😞 (R)						
	<b>Compartmentalisation of areas, stairs</b> -- e.g. shafts, fire doors (condition, obstructions), channels or holes (e.g. cables, pipes)	😊 (G) 😐 (Y) 😞 (R)						
	<b>The workplace fire marshals, etc.</b> -- trained, available	😊 (G) 😐 (Y) 😞 (R)						
	<b>Instructions in case of fire</b> -- evacuation plans, fire alarms, emergency exits and gangways, meeting points, fire drills, etc.	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Fire and explosion</b> (cont'd)	<b>Signs</b> -- storage sections, fire fighting devices, emergency exits, escape lighting, plans by floor, etc.	😊 (G) 😐 (Y) 😞 (R)						
	Is there a procedure to report these kinds of safety hazards?  Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)  😊 (G) 😐 (Y) 😞 (R)						
<b>Reporting hazards</b>								

Therefore, the overall situation for *Safety and mechanical -- Electricity, fire and explosions* is:



**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



### 3. Physical hazards - lighting

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) * cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
General lighting of the work areas and task	Neither too much nor too little: able to see the details of work, but not too bright	😊 (G) 😐 (Y) 😞 (R)						
	Acceptable, through clean windows?	😊 (G) 😐 (Y) 😞 (R)						
Shade on the work	Is there any?	😊 (G) 😐 (Y) 😞 (R)						
	On tables, metal or glass surfaces, plastic sheets, windows, screens?	😊 (G) 😐 (Y) 😞 (R)						
Reflections or glare	Especially by the sun: do windows have curtains, blinds or screens?	😊 (G) 😐 (Y) 😞 (R)						
	No direct sight of the light sources?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Lighting uniformity	In the work areas and gangways (staircases, etc.)?	😊 (G) 😐 (Y) 😞 (R)						
	Appropriate for the task, including colour rendering/appearance?	😊 (G) 😐 (Y) 😞 (R)						
Light fixtures	Cleaned regularly?	😊 (G) 😐 (Y) 😞 (R)						
	Defective bulbs are quickly replaced?	😊 (G) 😐 (Y) 😞 (R)						
Work at computer monitors	The worker does not face or have their back to a window or a significant light source	😊 (G) 😐 (Y) 😞 (R)						
	Is there a procedure to report lighting hazards?	😊 (G) 😐 (Y) 😞 (R)						
Reporting hazards	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Other prevention measures - Level 3 : Personal protective equipment (PPE)	Is there appropriate PPE where required for hazardous types of light?	😊 (G) 😇 (Y) 😞 (R)						
	Does the PPPE fit?	😊 (G) 😇 (Y) 😞 (R)						
	Is it stored properly? Replaced when necessary?	😊 (G) 😇 (Y) 😞 (R)						



Therefore, the **overall situation** for **Physical hazards** -- **lighting** is:

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



### 3. Physical hazards - noise

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R), what's the cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>In all work areas</b>	Do people a meter apart have to raise their voices to speak? (If so, it's more than 85 decibels)	😊 (G) 😐 (Y) 😞 (R)						
	Do sounds/noise interfere with talking, listening or concentrating?	😊 (G) 😐 (Y) 😞 (R)						
<b>Work stations</b>	As far as possible from noise sources?	😊 (G) 😐 (Y) 😞 (R)						
<b>Means of communication</b>	Does it account for ambient noise?	😊 (G) 😐 (Y) 😞 (R)						
<b>Holes, openings</b>	Is there noise from other workplaces, around doors, etc.?	😊 (G) 😐 (Y) 😞 (R)						
<b>Reporting hazards</b>	Is there a procedure to report noise hazards?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Reporting hazards (cont'd)	Is the procedure easy to use and followed?	(G) (Y) (R)						
Other prevention measures - Level 3 : Personal protective equipment (PPE)	Is there appropriate PPE where required for hazardous noise levels?	(G) (Y) (R)						
	Does the PPPE fit?	(G) (Y) (R)						
	Is it stored properly? Replaced when necessary?	(G) (Y) (R)						
	Are workers trained about how to use the PPE?	(G) (Y) (R)						

Therefore, the overall situation for **Physical hazards** -- noise is: 😊 😐 😞

Our questions are:

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



### 3. Physical hazards - temperature and humidity

Topic	Consider	The situation is ...	If not 😊 (G), what's the <u>problem</u> cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Temperature	Not too warm or too cold, no significant variations?	😊 (G) 😬 (Y) 😞 (R)						
Humidity	Not too dry or too humid?	😊 (G) 😬 (Y) 😞 (R)						
Drafts	By the windows and the doors? Elsewhere? (shouldn't be any)	😊 (G) 😬 (Y) 😞 (R)						
Sources of cold, heat and humidity	Are sources from water, vapours, machines, sun, etc. removed?	😊 (G) 😬 (Y) 😞 (R)						
Reporting hazards	Is there a procedure to report temperature and/or humidity hazards?	😊 (G) 😬 (Y) 😞 (R)						
	Is the procedure easy to use and followed?	😊 (G) 😬 (Y) 😞 (R)						
Work clothing	Comfortable for the temperature and/or humidity?	😊 (G) 😬 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the <u>problem</u> cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Other prevention measures - Level 3 : Protective clothing	Provided if necessary (e.g. for warmth or dryness, against radiating heat)?	😊 (G) 😐 (Y) 😞 (R)						
	Good quality, appropriate and comfortable?	😊 (G) 😐 (Y) 😞 (R)						
Drinks	Available where it is hot or cold?	😊 (G) 😐 (Y) 😞 (R)						

Therefore, the **overall situation** for *Physical hazards* -- *temperature and humidity* is: 😊 😐 😞

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



### 3. Physical hazards - vibration

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (Y) 😡 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Vehicles</b> (trucks, forklifts, etc.)	Appropriate for the job?	😊 (G) 😞 (Y) 😡 (R)						
	Floor, aisles, tires, seats and suspension in good condition?	😊 (G) 😞 (Y) 😡 (R)						
<b>Machines</b> (e.g. drills, grinders)	Appropriate for the work to be performed?	😊 (G) 😞 (Y) 😡 (R)						
	Not too heavy?	😊 (G) 😞 (Y) 😡 (R)						
	Not vibrating?	😊 (G) 😞 (Y) 😡 (R)						
<b>Tools and their parts</b>	In good condition and regularly maintained?	😊 (G) 😞 (Y) 😡 (R)						
	Adequate?	😊 (G) 😞 (Y) 😡 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Tools and their parts (cont'd)	In good condition?	😊 (G) 😐 (Y) 😞 (R)						
	Is there a procedure to report temperature and/or humidity hazards?	😊 (G) 😐 (Y) 😞 (R)						
Reporting hazards	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						
	Vehicles, machines and tools used properly?	😊 (G) 😐 (Y) 😞 (R)						
Training	Good work postures, forces, work with 1 or 2 hands, etc.?	😊 (G) 😐 (Y) 😞 (R)						

Therefore, the overall situation for **Physical hazards --vibration** is: 😊 😐 😞

Our questions are:

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 4. Chemical and mineral hazards

Topic	Consider	The situation is ...	If not 😊 (G), what's the <u>problem</u> cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Chemical or mineral hazards and products	Inventory of products and chemicals available and up to date?	😊 (G) 😇 (Y) 😞 (R)						
	Documentation about the hazards available, including material safety data sheets (MSDSs)?	😊 (G) 😇 (Y) 😞 (R)						
Procedures	About using chemicals and minerals: clear and followed, for mixtures, etc.?	😊 (G) 😇 (Y) 😞 (R)						
	In case of incidents (e.g. spills, splashes), are they known and followed?	😊 (G) 😇 (Y) 😞 (R)						
Labels	Appropriate and well-labelled containers?	😊 (G) 😇 (Y) 😞 (R)						
	By toxic, corrosive, flammable, etc. products?	😊 (G) 😇 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Storage (cont'd)	Stored in appropriate, isolated and labelled spaces?	😊 (G) 😟 (Y) 😞 (R)						
Wastes	Removed in a controlled way using proper procedures?	😊 (G) 😟 (Y) 😞 (R)						
	In appropriate containers?	😊 (G) 😟 (Y) 😞 (R)						
Signs	Appropriate and followed (no smoking, restricted areas, etc.)	😊 (G) 😟 (Y) 😞 (R)						
Training	About hazards and procedures? (WHMIS requirements met?)	😊 (G) 😟 (Y) 😞 (R)						
Reporting hazards	Is there a procedure to report chemical and mineral hazards?	😊 (G) 😟 (Y) 😞 (R)						
	Is the procedure easy to use and followed?	😊 (G) 😟 (Y) 😞 (R)						
Collective pre-vention measures (Level 1)	Toxics use reduction and "green" substitution policies?	😊 (G) 😟 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Collective prevention measures - Level 2	Local exhaust ventilation where required (is it right at the source)?	😊 (G) 😐 (Y) 😞 (R)						
	Ventilation system properly checked and maintained?	😊 (G) 😐 (Y) 😞 (R)						
	Operators isolated from exposure, if need be?	😊 (G) 😐 (Y) 😞 (R)						
Other prevention measures - Level 3	Showers, hand and eye wash stations well located and in good condition?	😊 (G) 😐 (Y) 😞 (R)						
	Appropriate rules that are followed (e.g. no smoking, restricted areas, etc.)?	😊 (G) 😐 (Y) 😞 (R)						
	General ventilation with fresh air?	😊 (G) 😐 (Y) 😞 (R)						
	No one eats on the job?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Other prevention measures - Level 3 : Personal protective equipment (PPE)	Gloves, masks, glasses, clothing, etc. available?	😊 (G) 😐 (Y) 😞 (R)						
	Appropriate for task, fit people?	😊 (G) 😐 (Y) 😞 (R)						
	Maintained, repaired and used properly?	😊 (G) 😐 (Y) 😞 (R)						
Attention to workers with special needs	Replaced when broken, not working, etc.?	😊 (G) 😐 (Y) 😞 (R)						
	Women (especially pregnant or nursing), young workers, those with allergies, with literacy and/or language needs, etc.?	😊 (G) 😐 (Y) 😞 (R)						



Therefore, the **overall situation** for **Chemical and mineral hazards** is:

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 5. Communicable/Biological hazards

Topic	Consider	The situation is ...	If not 😊 (G), what's the <u>problem</u> cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Communicable or biological hazards and products	Inventory of products and substances available and up to date?	😊 (G) 😐 (Y) 😞 (R)						
	Documentation about the hazards available, including material safety data sheets?	😊 (G) 😐 (Y) 😞 (R)						
Procedures	About using biological substances: are the procedures clear and followed, apply to mixtures, etc.?	😊 (G) 😐 (Y) 😞 (R)						
	In case of incidents (e.g. spills, splashes), are procedures known and followed?	😊 (G) 😐 (Y) 😞 (R)						
Labels	Appropriate and well-labelled containers?	😊 (G) 😐 (Y) 😞 (R)						
Storage	By category?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Storage (cont'd)	Stored in appropriate, isolated and labelled spaces?	😊 (G) 😐 (Y) 😞 (R)						
Wastes	Removed in a controlled way using proper procedures?	😊 (G) 😐 (Y) 😞 (R)						
	In appropriate containers?	😊 (G) 😐 (Y) 😞 (R)						
Signs	Appropriate and followed (no smoking, restricted areas, etc.)	😊 (G) 😐 (Y) 😞 (R)						
	About the procedures and hazards (WHMIS requirements met)?	😊 (G) 😐 (Y) 😞 (R)						
Training	Is there a procedure to report communicable or biological hazards?	😊 (G) 😐 (Y) 😞 (R)						
	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						
Collective pre-vention measures (Level 1)	No fungi or moulds	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Collective pre-vention measures (Level 1) (cont'd)	Toxics use reduction and "green" substitution policies?	(G) (Y) (R)						
	Local exhaust ventilation where required (at source)?	(G) (Y) (R)						
Collective pre-vention measures (Level 2)	Ventilation system properly checked and maintained?	(G) (Y) (R)						
	Operators isolated from exposure, if need be?	(G) (Y) (R)						
Other prevention measures - Level 3	Showers, hand and eye wash stations well located and in good condition?	(G) (Y) (R)						
	Appropriate rules that are followed (e.g. no smoking, restricted areas, etc.)?	(G) (Y) (R)						
	General ventilation with fresh air?	(G) (Y) (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Other prevention measures - Level 3 (cont'd)	No one eats on the job?	😊 (G) 😞 (Y) 😞 (R)						
	Vaccinations in order, as required	😊 (G) 😞 (Y) 😞 (R)						
	Gloves, masks, glasses, clothing, etc. available	😊 (G) 😞 (Y) 😞 (R)						
Other prevention measures - Level 3: Personal protective equipment (PPE)	Appropriate for task?	😊 (G) 😞 (Y) 😞 (R)						
	Maintained, repaired?	😊 (G) 😞 (Y) 😞 (R)						
	Fit people? Used properly?	😊 (G) 😞 (Y) 😞 (R)						
Attention to special needs workers	Women (esp. pregnant or nursing), young workers, those with allergies, for literacy and/or language needs, etc.	😊 (G) 😞 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Therefore, the **overall situation** for *Communicable/Biological hazards* is:



**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 6. Ergonomic design -- forms, controls and signals

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Work orders</b>	Forms, lists, etc. are legible?	😊 (G) 😐 (Y) 😞 (R)						
<b>Signals and controls</b> (e.g. buttons, levers, pedals)	In good condition?	😊 (G) 😐 (Y) 😞 (R)						
<b>Position</b>	Near and facing the worker, neither too high, nor too low?	😊 (G) 😐 (Y) 😞 (R)						
	Well located on the control panel (e.g. number and colours of buttons, lights)	😊 (G) 😐 (Y) 😞 (R)						
<b>Characteristics</b>	Emergency stop system (e.g. buttons, cables) available and easily accessible	😊 (G) 😐 (Y) 😞 (R)						
	Expected shapes, colours, directions (e.g. needles move from left to right, green = go or okay, red = stop)	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Characteristics</b> (cont'd)	Alarms can be heard or lights bright enough?	(G) (Y) (R)						
	Size, form and dimensions (e.g. buttons, indicators) are appropriate for people using them?	(G) (Y) (R)						
<b>Force</b>	No excessive pressure with the fingers or feet?	(G) (Y) (R)						
<b>Reporting hazards</b>	Is there a procedure to report these ergonomic hazards?	(G) (Y) (R)						
	Is the procedure easy to use and followed?	(G) (Y) (R)						

Therefore, the **overall situation for Ergonomic design -- forms, controls and signals** is: 😊 😐 😞

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 6. Ergonomic design -- work materials, tools, machines

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
For all work materials, tools and machines	Inventory available?	😊 (G) 😐 (Y) 😞 (R)						
	Appropriate for each task (e.g. dangerous machines are isolated for safety)	😊 (G) 😐 (Y) 😞 (R)						
Maintenance	Are tools and machines in good condition?	😊 (G) 😐 (Y) 😞 (R)						
	Regular maintenance, thorough annual checks?	😊 (G) 😐 (Y) 😞 (R)						
	Put away in case of problems (e.g. damaged cable, cracks, tears, general wear)?	😊 (G) 😐 (Y) 😞 (R)						
	Cleaned up and put away as needed, in places which are easily accessible to the work stations or areas?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Dimensions and forms (shapes)</b>	Easy to grab safely?	(G) (Y) (R)						
	Easy to use without tiring the hands or arms?	(G) (Y) (R)						
	Are handles adapted to the job (e.g. bent), not too long or too short, not too thick or too thin, not too rough or too smooth?	(G) (Y) (R)						
<b>Adapted to the worker?</b>	No parts that could cause injury?	(G) (Y) (R)						
	Not too heavy?	(G) (Y) (R)						
	No vibration?	(G) (Y) (R)						
	Adapted for left-handed people?	(G) (Y) (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Training	About the safest, healthiest and most efficient use of the materials, tools and machines?	😊 (G) 😐 (Y) 😞 (R)						
	Is there a procedure to report these ergonomic hazards?	😊 (G) 😐 (Y) 😞 (R)						
Reporting hazards	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						



Therefore, the overall situation for *Ergonomic design* -- *work materials, tools, machines* is:

Our questions are:

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 6. Ergonomic design -- repetition and postures

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Repetition of the same gestures	Not continuously?	😊 (G) 😐 (Y) 😞 (R)						
	Straight back, not bent?	😊 (G) 😐 (Y) 😞 (R)						
	Straight head (no flexion, extension nor rotation, i.e. neck is not twisted or bent)?	😊 (G) 😐 (Y) 😞 (R)						
Postures	Shoulders relaxed, not raised?	😊 (G) 😐 (Y) 😞 (R)						
	Arms close to the body, not spread out or raised above shoulder level?	😊 (G) 😐 (Y) 😞 (R)						
	Hands in a normal position, wrists not bent?	😊 (G) 😐 (Y) 😞 (R)						
	Feet on the ground or a foot rest?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Postures</b> (cont'd)	No kneeling or crouching without support or a cushion?	😊 (G) 😐 (Y) 😞 (R)						
	No repeated or prolonged uncomfortable positions?	😊 (G) 😐 (Y) 😞 (R)						
<b>Working heights</b> (e.g. of tables, desks, shelves, machinery, tools)	Make the work posture described above possible?	😊 (G) 😐 (Y) 😞 (R)						
	Appropriate seats that are stable and comfortable?	😊 (G) 😐 (Y) 😞 (R)						
<b>Seated or seated/standing posture</b> (preferred)	Support for the forearms on the desk or with armrests that can be adjusted for height?	😊 (G) 😐 (Y) 😞 (R)						
	Room for knees and legs under the desk or work surface?	😊 (G) 😐 (Y) 😞 (R)						
<b>Standing posture</b> (upright posture)	Nothing gets in the way of movements?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the <u>problem</u> cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Standing posture (upright posture) (cont'd)	Comfortable support for the thighs and/or the arms, at the appropriate height?	😊 (G) 😊 (Y) 😊 (R)						
	Step ladder available for working at heights?	😊 (G) 😊 (Y) 😊 (R)						
	Step ladder is stable, solid, and easy to use safely (to avoid falls)?	😊 (G) 😊 (Y) 😊 (R)						
Reporting hazards	Is there a procedure to report these ergonomic hazards?	😊 (G) 😊 (Y) 😊 (R)						
	Is the procedure easy to use and followed?	😊 (G) 😊 (Y) 😊 (R)						

Therefore, the overall situation for *Ergonomic design -- repetition and posture* is: 😊 😊 😊

Our questions are:

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 6. Ergonomic design -- force (including materials handling)

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem the cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Gestures (movements) and forces	Not abrupt?	😊 (G) 😟 (Y) 😡 (R)						
	Not too hard or forceful?	😊 (G) 😟 (Y) 😡 (R)						
	No fast or repeated movements?	😊 (G) 😟 (Y) 😡 (R)						
Hand forces	Moderate, without bending or twisting?	😊 (G) 😟 (Y) 😡 (R)						
	Not using the hand as a hammer?	😊 (G) 😟 (Y) 😡 (R)						
Loads	Light?	😊 (G) 😟 (Y) 😡 (R)						
	Balanced?	😊 (G) 😟 (Y) 😡 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Loads</b> (cont'd)	Comfortable to grab (pick up) (e.g. good handles, no cutting edges, not slippery, not too hot or too cold)?	😊 (G) 😟 (Y) 😞 (R)						
	At a good height (i.e. picking up and putting down at waist level)	😊 (G) 😟 (Y) 😞 (R)						
	Back is not twisted or bent (depending on the situation)?	😊 (G) 😟 (Y) 😞 (R)						
<b>Mechanical devices</b>	Carried only for a short distance?	😊 (G) 😟 (Y) 😞 (R)						
	Appropriate for the task -- for heavy or unstable loads, hoists, trucks, etc. (pushed rather than pulled)?	😊 (G) 😟 (Y) 😞 (R)						
	Appropriate for the task -- for frequent movement: conveyor belts, etc.?	😊 (G) 😟 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Mechanical devices (cont'd)	High standard?	😊 (G) 😐 (Y) 😞 (R)						
	Well-located?	😊 (G) 😐 (Y) 😞 (R)						
	Quick and easy to use?	😊 (G) 😐 (Y) 😞 (R)						
Training	About how to handle loads?	😊 (G) 😐 (Y) 😞 (R)						
	Appropriate to the work situation?	😊 (G) 😐 (Y) 😞 (R)						
	Acceptable amount?	😊 (G) 😐 (Y) 😞 (R)						
Tiredness at the end of the day	Is there a procedure to report these ergonomic hazards?	😊 (G) 😐 (Y) 😞 (R)						
	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Therefore, the **overall situation** for **Ergonomic design** -- **force** (*including materials handling*) is:  
**Our questions are:**



\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 7. Work organization/stressors -- Work procedures, etc.

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Work organization</b>	Clear and appropriate?	😊 (G) 😐 (Y) 😞 (R)						
	Lets people work without facing health or safety hazards?	😊 (G) 😐 (Y) 😞 (R)						
	Work planning appropriate in time and space?	😊 (G) 😐 (Y) 😞 (R)						
<b>Work procedures</b>	Work procedures clear and applied?	😊 (G) 😐 (Y) 😞 (R)						
<b>Work circumstances</b> (places, tools, materials, stock, unforeseen events, external requests, time, etc.)	Allow applications of the usual work procedures?	😊 (G) 😐 (Y) 😞 (R)						
	Quality work is possible?	😊 (G) 😐 (Y) 😞 (R)						
<b>Supplies/stock</b>	Inventory and stock sizes are not too large or too small?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Independence between neighbouring work stations or areas</b>	Not too much or too little?	(G) (Y) (R)						
<b>Interactions and communications</b> (between workers)	Easy and free, even if at different work stations?	(G) (Y) (R)						
<b>Means of communication</b>	Appropriate and pleasant? (if voice, computer, etc.)	(G) (Y) (R)						
<b>All work areas or vehicles</b>	Is anyone isolated or working alone?	(G) (Y) (R)						
<b>Reporting hazards</b>	Is there a procedure to report these stressors?	(G) (Y) (R)						
	Is the procedure easy to use and followed?	(G) (Y) (R)						



Therefore, the overall situation for **Work organization/stressors** -- **work procedures, etc.** is:

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 7. Work organization/stressors -- Autonomy and responsibilities

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Orders and expectations	No contradictions?	😊 (G) 😐 (Y) 😞 (R)						
Range of initiative	Everyone can adapt the way s/he works without disturbing others?	😊 (G) 😐 (Y) 😞 (R)						
Autonomy	Everyone can leave his/her workstation for short breaks (e.g. washroom) without disturbing production or work activities?	😊 (G) 😐 (Y) 😞 (R)						
Freedom of contact	Everyone has the contact needed with peripheral co-workers (e.g. maintenance, purchasing, quality) or with other departments?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Degree of attention or concentration needed	Average according to the seriousness of the actions/ tasks required?	(G) (Y) (R)						
	Average, according to the unpredictable nature of the tasks?	(G) (Y) (R)						
Decisions	Limited number of possible choices?	(G) (Y) (R)						
	Information available?	(G) (Y) (R)						
	Decisions not too difficult to make?	(G) (Y) (R)						
Responsibilities	Required reaction speed is normal?	(G) (Y) (R)						
	Not too many or too few?	(G) (Y) (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Responsibilities</b> (cont'd)	Everyone knows their responsibilities and carries them out?	😊 (G) 😐 (Y) 😞 (R)						
<b>Errors</b>	Everyone can correct his or her errors themselves?	😊 (G) 😐 (Y) 😞 (R)						
<b>Reporting hazards</b>	Is there a procedure to report these stressors?	😊 (G) 😐 (Y) 😞 (R)						
	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						



Therefore, the **overall situation** for **Work organization/stressors** -- **autonomy and responsibilities** is:

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 7. Work organization/stressors -- work content

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Work interest	Interesting and diversified (including preparation tasks, quality, maintenance)?	😊 (G) 😐 (Y) 😞 (R)						
	Everyone's work corresponds to their function and work capacities?	😊 (G) 😐 (Y) 😞 (R)						
Quality	For everyone?	😊 (G) 😐 (Y) 😞 (R)						
	About procedures, hazards and prevention methods?	😊 (G) 😐 (Y) 😞 (R)						
Information and training	When starting a job or new task, and regularly after (e.g. refreshers)?	😊 (G) 😐 (Y) 😞 (R)						
	Not too heavy?	😊 (G) 😐 (Y) 😞 (R)						
Emotional load								

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Reporting hazards</b>	Is there a procedure to report these stressors?	😊 (G) 😐 (Y) 😞 (R)						
<b>Reporting hazards (cont'd)</b>	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						

Therefore, the **overall situation** for **Work organization/stressors** -- **work content** is: 😊 😐 😞

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 7. Work organization/stressors -- time constraints

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Work schedules and work program</b>	Received sufficiently in advance?	😊 (G) 😐 (Y) 😞 (R)						
	Allow everyone to organize their working day as s/he wants?	😊 (G) 😐 (Y) 😞 (R)						
	Flexible within an acceptable range?	😊 (G) 😐 (Y) 😞 (R)						
<b>Work rate</b>	Not excessive?	😊 (G) 😐 (Y) 😞 (R)						
	Can catch up quickly if need be (e.g. if production delays, interruptions)?	😊 (G) 😐 (Y) 😞 (R)						
<b>Group autonomy</b> (the group organizes itself about these things)	Work schedules and holidays?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Group autonomy</b> (the group organizes itself about these things) (cont'd)	Work distribution, breaks, rotations?	😊 (G) 😐 (Y) 😞 (R)						
	Production or work delays?	😊 (G) 😐 (Y) 😞 (R)						
	Overtime?	😊 (G) 😐 (Y) 😞 (R)						
	Peak and off periods?	😊 (G) 😐 (Y) 😞 (R)						
<b>Work interruptions</b>	Additional and last-minute work?	😊 (G) 😐 (Y) 😞 (R)						
	Few unexpected events?	😊 (G) 😐 (Y) 😞 (R)						
<b>Breaks/rest periods</b>	Frequent and short?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Breaks/rest periods</b> (cont'd)	Organized to consider work-load, difficult postures, repetitive movements and mental fatigue?	(G) (Y) (R)						
<b>Reporting hazards</b>	Is there a procedure to report these stressors?	(G) (Y) (R)						
	Is the procedure easy to use and followed?	(G) (Y) (R)						



Therefore, the overall situation for *Work organization/stressors* -- *time constraints*. is:

Our questions are:

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 7. Work organization/stressors -- Relationships between workers and with management

Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Communications during work	Always possible, whether related to work or not?	😊 (G) 😐 (Y) 😞 (R)						
	The organization of the work and space lets people see one another?	😊 (G) 😐 (Y) 😞 (R)						
Allocation of work	Impartial within the group?	😊 (G) 😐 (Y) 😞 (R)						
	Everyone knows their work and role?	😊 (G) 😐 (Y) 😞 (R)						
Mutual assistance between workers	Is there for work problems?	😊 (G) 😐 (Y) 😞 (R)						
There is regular consultation about the work	Among the workers, departments and management?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R), what's the cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
There is regular consultation about the work (cont'd)	To solve the problems	😊 (G) 😐 (Y) 😞 (R)						
	To define, plan and allocate work?	😊 (G) 😐 (Y) 😞 (R)						
The management	Is known, appreciated and respected?	😊 (G) 😐 (Y) 😞 (R)						
	There is harmony, confidence, co-operation and good social climate?	😊 (G) 😐 (Y) 😞 (R)						
Relations with the management	No strained relations, no conflicts of interest?	😊 (G) 😐 (Y) 😞 (R)						
	Support in case of work or personal difficulties?	😊 (G) 😐 (Y) 😞 (R)						
	Responsibilities are delegated?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem 😞 (R) cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Workers' suggestions and feedback	Encouraged, heard and taken into account?	😊 (G) 😐 (Y) 😞 (R)						
	Problems are reported?	😊 (G) 😐 (Y) 😞 (R)						
	Everyone knows how their work is evaluated?	😊 (G) 😐 (Y) 😞 (R)						
Evaluations	Knows if and how they are monitored?	😊 (G) 😐 (Y) 😞 (R)						
	Everyone knows the evaluation criteria and consequences	😊 (G) 😐 (Y) 😞 (R)						
	Each person is told about the results of their evaluation?	😊 (G) 😐 (Y) 😞 (R)						
	Everyone's work is properly appreciated?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Reporting hazards</b>	Is there a procedure to report these stressors?	😊 (G) 😐 (Y) 😞 (R)						
	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						



Therefore, the **overall situation** for *Work organization/stressors* --  
*Relationships between workers and with the management* is:

**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



## 7. Work organization/stressors -- Social and general environment

Topic	Consider	The situation is ...	If not 😊 (G), what's the <u>problem</u> cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
Promotions (are possible)	According to clear and unbiased criteria, known and approved by all (and/or in the union contract)?	😊 (G) 😐 (Y) 😞 (R)						
	On the basis of evaluations and according to performance and/or union contract?	😊 (G) 😐 (Y) 😞 (R)						
Discrimination	None by age, sex, heritage, sexual orientation, union membership, personal characteristics, etc.	😊 (G) 😐 (Y) 😞 (R)						
	None used in hiring or promotions?	😊 (G) 😐 (Y) 😞 (R)						
Employment	Stable?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Employment</b> (cont'd)	Confidence in the organization's integrity and future (i.e. job security)?	😊 (G) 😐 (Y) 😞 (R)						
	Return-to-work and use of replacements and temporary workers are well managed?	😊 (G) 😐 (Y) 😞 (R)						
<b>Salary or wages</b>	Corresponds to required capacities the work done and/or the union contract?	😊 (G) 😐 (Y) 😞 (R)						
	All members able to do their committee duties?	😊 (G) 😐 (Y) 😞 (R)						
<b>Workplace safety and health committee or representative</b>	Is effective and respected?	😊 (G) 😐 (Y) 😞 (R)						
	Is there dissatisfaction, stress, strain, harassment, etc.?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Topic	Consider	The situation is ...	If not 😊 (G), what's the problem cost? *	What can be done to improve the situation right away?	By whom?	By when?	What does the quick solution cost? *	Need to check out more?
<b>Stress and strain (toxic stress) problems (cont'd)</b>	Support policies and procedures exist and are used?	😊 (G) 😐 (Y) 😞 (R)						
	Preventive action(s) are taken when problems or issues come up?	😊 (G) 😐 (Y) 😞 (R)						
<b>Working conditions in general</b>	Allow personal and professional development?	😊 (G) 😐 (Y) 😞 (R)						
	Compatible with outside life (e.g. family and other responsibilities)	😊 (G) 😐 (Y) 😞 (R)						
	All workers are satisfied, on the whole	😊 (G) 😐 (Y) 😞 (R)						
<b>Reporting hazards</b>	Is there a procedure to report these stressors?	😊 (G) 😐 (Y) 😞 (R)						
	Is the procedure easy to use and followed?	😊 (G) 😐 (Y) 😞 (R)						

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



Therefore, the **overall situation** for **Work organization/stressors -- Social and general environment** is:



**Our questions are:**

\* Costs, in terms of time, effort and money: nothing (0), a little (\$), some (\$\$), or a lot (\$\$\$)



# Inspections - what the HEC\* is going on?

Choose the hazard category for which you are using this sheet; write that on the line in the second column. Use page one to list the hazards found. Use the second page to jot down ideas about priorities, possible solutions and, if it's a quick fix, who's to do what by when.

Date: \_\_\_\_\_ Work area: \_\_\_\_\_ Done by: \_\_\_\_\_

Item #	What are the Hazards?	What are the Exposures?		What are the Consequences?								
		Is exposure possible?	What prevention/control measures are there supposed to be?	How well are they working?	Who can be exposed?	How often?	How long?	How much?	What is the possible effect?			



\*HEC = Hazard? Exposure? Consequences?

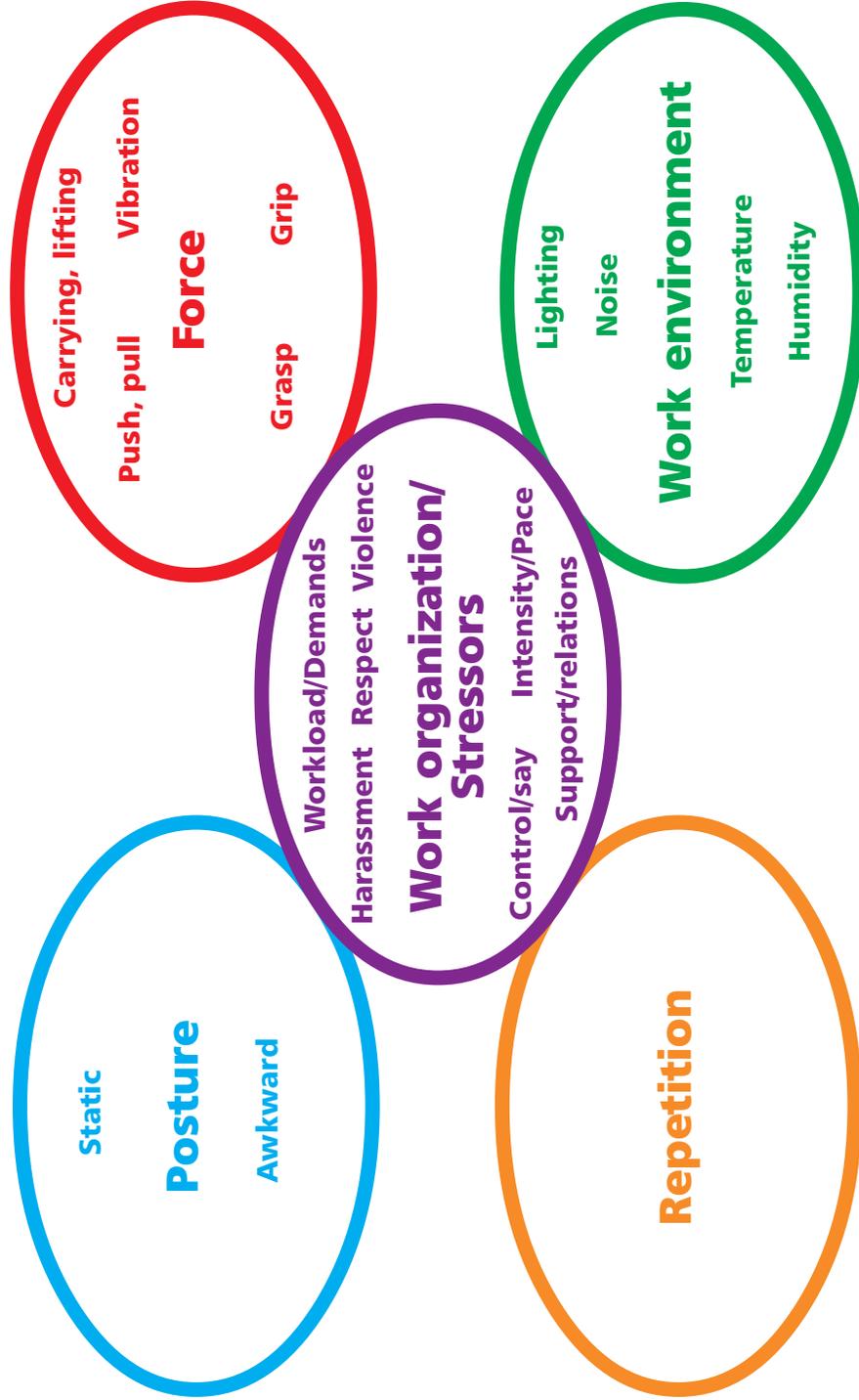


Item #	Problem/hazard	Priority	Action required		Who's involved?	Dates for change	Done & checked by
			Short - term	Long - term			





# Ergonomic hazards - the problems behind our aches and pains





# Ergonomic hazards lead to musculoskeletal injuries (MSIs)

Ergonomics can be defined as the “law of work”. The approach is to **fit the job to the worker**, not the other way around. It’s about how much people are expected to do with their bodies and brains. As a Canadian ergonomist says, workers are expected to do things on the job that robots don’t do.

When an ergonomic approach is not used to design work activities, tools and/or equipment, you may be exposed to (your body comes in contact with or must deal with) a variety of problems. The odds are that you will end up with “aches and pains”, “sprains and sprains”, musculoskeletal injuries (MSIs) -- whatever you call it, it’s a lot of pain.

When wear and tear reaches a certain point, the result is some kind of disability. It can be short-term but many take a long time to heal, partly because the hazard is not fixed. Sometimes, the damage is permanent.

Whether it lasts a long time or a short time, an MSI affects life on and off the job. Everyday activities can be difficult or impossible -- opening a jar, chopping an onion, driving a car, lifting a child, turning a door knob, getting dressed, and holding a toothbrush.

These injuries, and their often-unseen effects, can be prevented -- by dealing with the hazard(s). There are different types of ergonomic hazards; here are some definitions and examples:

## Force:

The amount of pressure a person uses for a task. It includes pushing, pulling, lifting and even using a computer keyboard. Force puts a strain on the body and can cause damage to body parts or tissues.

Contact stress is one type of force. This may occur if a tool handle or edge digs into the soft tissue of the palm of the hand, the hand is used as a hammer, or someone works on their knees. The contact concentrates force on a small area, putting pressure on those tissues. It may cause injuries.

Vibration is another kind of force. It is found in vibrating tools and equipment. When vibration affects the hands and arms, it can

damage the nerves and/or blood vessels so that a person’s hands/fingertips go numb and cannot be used easily.

Examples of force include:

- lifting heavy boxes
- the grasp or grip used to hold something (avoid pinch grips)
- computer keyboard work
- jack hammer (vibration)
- resting the palm of hand or wrist on a tool handle or edge of something

## Posture:

Awkward posture is working in positions that feel uncomfortable. It could be working with your arms over your head,

twisting, bending or reaching, or working with a bent back, bent wrist, etc. This can stretch a person’s physical limits, compress nerves and irritate tendons.

Static posture involves working with your body or (part of) a limb in one position for a long time. This includes constant standing or sitting or holding your arm, neck or shoulder in one position. Doing this can restrict blood flow and damage muscles.

Examples of posture hazards include:

- working with arms above your head (awkward; also static if it lasts)
- working with bent joints (awkward; also static if it lasts)

## Ergonomic hazards





- standing or kneeling for a while (static)
- working with your neck cricked to see the computer screen (awkward and static)

**Repetition:**

This means doing the same motion over and over, without adequate rest -- even mini- breaks. Repetition overuses the same muscles, tendons, and other soft tissues. It can irritate tendons and increase pressure on nerves and may cause permanent damage.

Examples of repetition include:

- traditional assembly line work
- data entry
- piecework sewing

**Work environment:**

These hazards are part of the general work environment; as energy sources, they also are physical hazards such as humidity, temperature, noise and light.

People working in cold temperatures can get stiff and sore; they may drop things. Noise causes deafness and interferes with our ability to hear and understand people's words and other sounds. Poor lighting can lead to trips or falls and poor postures as we try to read things (e.g. with glare).

Examples of ergonomic work environment hazards include:

- working with cold objects
- outdoors work during the summer
- working indoors with low or high humidity
- work with or near loud machinery or equipment
- poor lighting (too much or little)

**Stressors/work organisation:**

These hazards "stress us out". But it is not easy to see these invisible aspects of work.

Stressors include:

- how much say or control we have about our work;
- how people and technology work together to produce a product or provide a service;
- too much or too little workload or demands on our body and mind; and
- the amount of respect and support we (don't) get on the job.

Job-related stressors are the result of choices those in authority make. They cover "technical aspects" of work -- production methods, technology -- and the "people aspects" -- how people will use the technology, how our skills and knowledge are used (or not), social interactions, etc.

Stressors or work organization hazards that are important in ergonomic issues include:

- pace of work
- workload
- staffing levels
- hours of work
- supervision style
- production quotas
- deadlines
- number and length of rest breaks
- flexibility allowed for family and other responsibilities
- violence (including harassment and discrimination)

Work organization hazards/stressors are at the center of the ergonomic hazards chart. That's because they are often the "why?" behind many other hazards. Studies also tell us that "stress" sets us up for MSIs in the neck, shoulders and lower back.

For example, if the speed of a job is increased, workers may have more repetitive motions, perhaps in more static postures. Deadlines or production quotas can cause muscles to tense up, adding to "wear and tear" on soft tissues and leading to MSIs.

To figure out how stressors and other ergonomic hazards are connected, try asking:

1. *But why? (up to five times);* or
2. *What makes the symptoms worse?*







## Ergonomic hazards - examples of musculoskeletal injuries (MSIs)

Body part	MSI	Description	Symptoms	Activity/symptom link
Arms	Epicondylitis	"tennis elbow" affects the tendons on the lateral/outside of the elbow; "golfer's elbow" affects those on the medial/in side	pain, weakness, swelling, burning sensation or dull ache from elbow sometimes to wrist, when picking up things with wrist bent	repeated bending or straightening of the elbow from its neutral position (a right angle); twisting wrist and forearm <i>lateral</i> : hammering, lifting with out-stretched fingers, bending wrist against force <i>medial</i> : rotating forearm and bending wrist at the same time
Back	Back pain	pain anywhere in the back; often in the lower back, below the waist	tenderness, stiffness or fatigue which may be linked to disc, vertebrae, ligament, muscle, spinal cord or nerve problems	lifting, carrying, pushing, pulling, sitting or standing all day, walking on hard surfaces, etc.
Feet	Achilles tendonitis	inflammation of the tendon connecting the heel bone to calf muscles in the back of the leg	pain at the heel and lower back leg, difficulty walking, ankle's not flexible	inflexible shoes, going from high heels to flat shoes/ runners
	Ganglion	a mass forms when tissues around certain joints gets inflamed and swells with fluid	hard "bump" under the skin, usually on top of foot	tight footwear
Knees	Bursitis	"housemaid's knee", "carpetlayer's knee"	pain and swelling	working on or with knee often using force
Neck and shoulders	Biceps tendonitis	pain where the biceps tendon meets the shoulder joint	pain when raising arms, lifting, pulling	slumped posture, moving arm across desk that's too high/far away
	Bursitis	bursa inflamed	pain, perhaps restricted movement	work with arms above shoulders
	Rotator cuff tendonitis	inflammation of one or more shoulder tendons	pain, weakness, swelling, burning sensation or dull ache when reaching	arms raised away from the sides, usually also rotating the arm from the shoulder



Body part	MSI	Description	Symptoms	Activity/symptom link
<b>Neck and shoulders</b> (cont'd)	Tension neck syndrome	involves neck muscles	pain in neck and shoulder area, guarding muscles, limited range of neck motion	stress, computer work, assembly line work, holding neck in one (static) position
	Thoracic outlet syndrome	the neck and shoulder nerves and blood vessels are compressed/squashed	pain, numbness, swelling of the hands, weakness from forearm down, cold	prolonged shoulder flexion, overhead work, carrying heavy loads on the shoulder or with arms at the side
<b>Wrist and hands</b>	Carpal tunnel syndrome	the median nerve going through the wrist bones is squeezed by inflamed tendons and then by inflamed tendon sheaths/covers	tingling, numbness (thumb and first 2 or 3 fingers), burning, pain (that may wake you up), wasting of muscles at base of thumb, dry palm, can't grasp	bending and straightening wrist repeatedly and rapidly, especially flexion – moving the wrist (up) towards the body – combined with force
	DeQuervain's disease/syndrome	tendon and its sheath at base of thumb are inflamed	pain, weakness at base of the thumb, side of the wrist and sometimes index finger, especially when doing something like turning a beer cap or wringing things	using pinch grip - thumb and forefinger - especially with force (e.g. grabbing file folders)
	Dupuytren's contracture	ring (and then middle and little) fingers pulled towards palm	thickened palm or nodule on finger tendon	often inherited but aggravated by typing and other repeated small movements of the palm of the hand
	Extensor tendonitis	tendons of muscles that straighten/bend fingers affected	pain on top of hand near the wrist	holding hands in "stop traffic" position
	Ganglion	see above	aches and weakness; bump under the skin	precise, repetitive hand movements
	Trigger finger	tendonitis/tenosynovitis of fingers, also called flexor tendonitis	pain, fingers locked in bent position	pinch grip, pulling tool trigger repeatedly, especially with bent wrist
	Vibration white hand/Raynaud's/"white finger"	hand and finger blood vessels are constricted (made smaller)	fingers turn white and numb, can't hold things, do up zippers	vibration, aggravated by smoking and some drugs that constrict blood vessels



# Ergonomic hazards - some myths & realities

## Computer work stations: *conventional versus current wisdom*

There are a lot of myths out there about how to set up computer work stations. The conventional and current wisdom about this topic is explained on a website that has other information about office ergonomics (<http://www.office-ergo.com>). The text in this document comes from that site, except where there are notes in brackets. It's re-formatted to be more user-friendly.

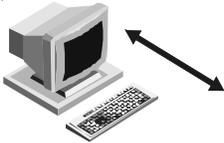
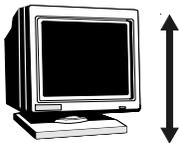
Most of us have some misinformation about office setup and posture. Much of the misinformation is quite old, but it persists because:

- We've heard it all our lives,
- Everybody we know seems to think the same thing,
- It sort of makes mechanical sense (but not biological sense!),
- We actually heard or saw it RECENTLY, perhaps in a sales presentation for some kind of ergo gizmo.

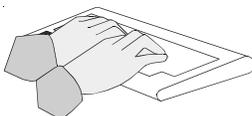
Unfortunately, not all writers, trainers, product designers, or even physicians can keep up with all the scientific developments.

Here are examples of conventional ergonomic wisdom that are being disproved. Happily, most involve a RELAXING of old strict rules.

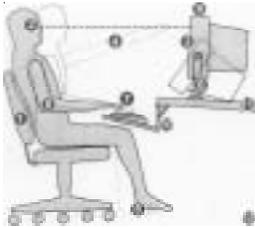
Current ergonomics encourages variety and movement rather than an exact posture. The ultimate standard is individual comfort (especially over time), tempered by individual preference, control, and choices.

Topic	Conventional wisdom	Current wisdom
<b>Monitor distance</b> 	It should be 18-24 inches away.	The best distance is "as far away as possible while still being able to read it clearly." Longer distances relax the eyes. The "conventional" 18-24 inch recommendation is unnecessarily close.
<b>Monitor height</b> 	The top of the screen should be about eye height. Put the monitor on top of the CPU.	This is fine for some people, wrong for many. The current recommendation is that eye height is the highest a monitor should be, not the best height. Many people find a low monitor is more comfortable for the eyes and neck. Put the monitor on the work surface, because of the height issue.



Topic	Conventional wisdom	Current wisdom
<b>Wrist angle</b> 	Keep them straight.	As far as we know, this is correct.
<b>Wrist rests</b> 	They can do no wrong and should always be used. You only need them for the keyboard but not the mouse.	This is wrong. They may cause harm if they're too thick, too thin, too hard, or have sharp edges (even sharp foam edges). They also can cause harm, we think, if they're constantly used - they probably should be used just during pauses. The carpal tunnel is under the wrist/palm and should not be subjected to much extra pressure. Mouse wrist rests are a good idea in many cases, but the same warnings apply.
<b>Keyboard design</b> 	"Ergonomic" keyboards are good for everybody.	Actually, some are good and some are probably bad. Some are right for some people and not for others. The only kind of ergonomic keyboard that many ergonomists can recommend in good conscience is one that can be configured to look exactly like a normal keyboard. These boards are hinged and can be changed to a new shape gradually. (Note: This means that ones like Microsoft's "ergonomic" wavy keyboard are not; the Goldtouch keyboard -- at left - is one true ergonomic on the market, according to studies by NIOSH.)
<b>Keyboard distance</b> 	It should be approximately at the front of the work surface.	This conventional wisdom is limiting. There's nothing wrong with pushing the keyboard back farther if the forearms are supported, provided the wrist is kept straight and the elbows aren't resting on anything hard or sharp. Usually, to make a pushed-back keyboard work, the work surface should be higher than elbow height. (see keyboard height, below)
<b>Keyboard height</b>	It should be at elbow height.	This is wrong, or at least too narrow. Variation from elbow height is fine, especially in the lower-than-elbow direction.
<b>Keyboard angle</b> 	It should be flat, or up on its little support legs.	This is wrong. The keyboard angle depends entirely on the forearm angle. It should be in the same plane as the forearm. Therefore, a low keyboard should be slanted back. Some people expect they won't be able to see the keys if the keyboard is sloped back, but this is usually not a problem.



Topic	Conventional wisdom	Current wisdom
<p><b>Mouse placement</b></p> 	<p>Push it away</p>	<p>Closer is usually better - next to the keyboard is the goal. (NOTE: this is why keyboards without number pads are best. The space the pads occupy is really where the mouse should be. Consider a fixed mouse too.)</p>
<p><b>Chair height</b></p> 	<p>The height should allow the feet to reach the floor when the legs are in the “conventional wisdom” position of 90 degrees (at the knee).</p>	<p>The 90-degree knee posture is not “correct” ergonomics although it is not harmful. The legs should move very often, not stay fixed in the 90- degree position. The chair should, if possible, be low - low enough for the feet to rest on the floor, even when extended. However, if the chair is at a good height but the keyboard height can’t be adjusted to elbow height or lower, then it’s necessary to adjust the chair upwards. In this case, a footrest is an option.</p>
<p><b>Footrests</b></p>	<p>These are always a fine alternative and chairs and work surfaces don’t need to be lowered if one is available.</p>	<p>The truth is that footrests are a distinctly second-class choice because the feet only have one place to be, and leg postures are limited. However, if the chair is already low enough, footrests offer a chance to change leg postures and are recommended.</p>
<p><b>General posture</b></p> 	<p>There is a “correct” one.</p>	<p>Posture change seems to be as important as posture correctness, especially for the spine’s intervertebral discs. The discs lose fluid during the day because of the weight they carry. It appears that posture change is essential to help pump fluid back into the discs. People who stand all day tend to have back problems - but so do people who sit still all day.</p>
<p><b>Sitting posture</b></p> 	<p>Wisdom prescribes an upright posture, with the hips at 90 degrees.</p>	<p>Research supports having a much wider hip angle - with 130 degrees or so as an “optimum” angle. The reason? When the hips are straightened, the vertebrae of the lower spine are aligned with each other in a way that reduces and evens out pressure on the intervertebral discs. In fact, sitting upright is less desirable than reclining. When reclining, the lower back muscles work less and the spine supports less weight, since body weight is held up by the chair’s backrest.</p>

**Ergonomic hazards - some myths & realities**

**Computer work stations:  
conventional versus current wisdom**

Topic	Conventional wisdom	Current wisdom
<b>Rest breaks</b>	Recommendations are usually for ones about 15 minutes long, every two hours or so.	This is insufficient for single-task work such as typing. Research supports the idea of very short breaks taken very frequently. For example, 30-second breaks every 10 minutes or so. These should be in addition to the normal 15-minute coffee breaks.



# Ergonomic hazards - some myths & realities

## Women need “special treatment”

People in the same jobs will do their jobs differently. After all, individuals are not the same anthropometrically; our body parts are often different lengths and widths and proportionally not exactly the same as other people.

Here are some things to consider:

- ❑ jobs in which women work are usually more repetitive, monotonous and stressful than men’s
- ❑ caring, nurturing and supportive roles are key parts of women’s work, while men still tend to do “heavy” manual, technical and managerial tasks
- ❑ men are more often exposed to chemicals, forceful exertions, and vibration



- ❑ tool design, working surface height, and equipment dimensions can make very different demands on the body, depending on workers’ dimensions (anthropometry)
- ❑ using “average” sizes or dimensions can make a big deal out of physical differences between men and women when it’s less of an issue in real life. Differences are important, but so is the amount of overlap (e.g., how well hands fit, or don’t fit tools; amounts that can be lifted in what circumstances).

In a study at Canadian army bases:

- average wrist to index finger length for women was 170 mm (6.7 inches) and for men - 183 mm (7.2 inches) or 7.6% higher
- 92% of the women’s hands were shorter than that of the average man
- about 92% of the men’s hands are longer than that of the average woman;
- 36% of the women’s and 46% of the men’s hands were between 170 mm & 183 mm long
- **when height and size are factored in, apparent gender differences in workplace health problems may disappear**

The bottom line: avoid stereotypes, but be aware that differences exist. Yes, ergonomics is about adapting workplaces, tools and equipment to individual’s needs, but finding problems also requires looking for patterns and investigating individual situations.





## Ergonomic hazards: Step 1. *Looking for symptoms*

### A screening checklist adapted from the SOBANE method\*

#### Instructions:

Start with the first page to get basic information. Ask about each body area listed in the left-hand column. For each area that applies, check the box and quickly fill in the symptoms or information about the symptoms in the “Summarise here” section. Don’t get into details; use it as a checklist to prepare for the next page with the body map.

Then have the person fill out the body map on the next page; this provides more specific information.

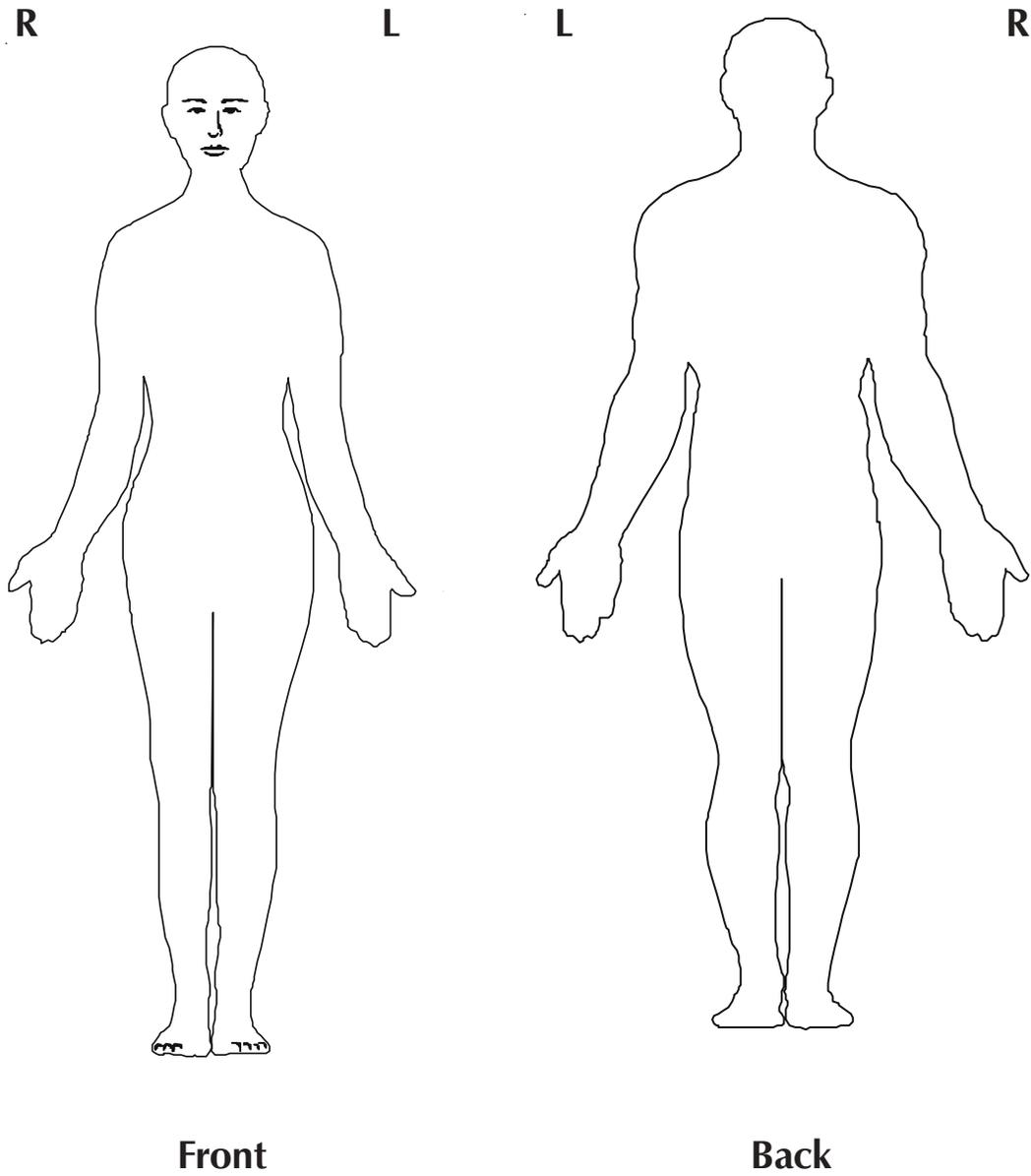
In the next section, ask the person to go over the specific spots on the body map. For each one, ask the questions in the columns, except for the shaded one. That’s the place for you to later analyze which ergonomics hazards are (likely) present.

<b>Workplace:</b>	<b>Name of person:</b>
<b>Work station/job</b>	<b>Date of discussion:</b> <b>With</b> (person filling in form):
<p><b>What kinds of problems or complaints are there about aches and pains or discomfort in the:</b></p> <p><input type="checkbox"/> head?</p> <p><input type="checkbox"/> neck?</p> <p><input type="checkbox"/> shoulders?</p> <p><input type="checkbox"/> elbows and arms?</p> <p><input type="checkbox"/> wrists and hands?</p> <p><input type="checkbox"/> back?</p> <p><input type="checkbox"/> legs?</p> <p><input type="checkbox"/> knees?</p> <p><input type="checkbox"/> feet?</p> <p><b>(whether or not you think they are related to the job)</b></p>	<p><b>Summarize here:</b></p> <p><b>For details, use the body map on the next page.</b></p>

\* See [www.sobane.be/fr./tms.html](http://www.sobane.be/fr./tms.html) and [www.sobane.be/langue\\_eng.html](http://www.sobane.be/langue_eng.html)



**Step 1 for finding ergonomic hazards: Screening**



**Step 1 for finding ergonomic hazards: Screening**

<b>Body area affected</b> (from body map)	<b>When?</b> (What are you doing when you notice the ache/pain/discomfort?)	<b>What causes the problem or complaint?</b>	<b>What kind of ergonomic hazard is it?*</b> (fill in later, if need be)	<b>What can be done immediately to avoid it?</b>	<b>What should be analyzed or investigated in more detail?</b> (See SH.10)

\***Uncomfortable postures or positions:** twisting, arms raised, bent wrists, pinch grip with fingers, non-neutral positions  
**Heavy and repeated efforts (force):** tightening things, pulling, pushing, lifting, hitting something  
**Repetition:** of the same movement or gestures

**Work environment issues:** humidity, temperature, vibration, lighting or other physical hazards  
**Stressors/work organization hazards:** pace of work, time pressures, inadequate machines or tools, chance of violence, no say about what you're doing, little or no support or respect, etc.





## Ergonomic hazards: Step 2 - Looking for the hazards

An observation checklist adapted from the SOBANE method\*

Instructions:

Look at the observation heading. Decide if it applies. Then use the observation sheet for each topic.

Work station/job: \_\_\_\_\_

Date: \_\_\_\_\_

Observation headings	Check out	Applicable?
1. Computer or monitor work	Arrangement of the work station	
2. Tools, materials, controls, products	Visual controls	
	Reach distance	
3. Tools	Tools adapted/adjustable for work and workers	
	Handle shape	
	Weight	
	Controls	
4. Work station - obstructions	Obstructions at the work station	
	Obstructions under the work surface	
5. Posture - sitting	Work surface height	
	Quality of the seat/chair	
	Back support	
	Adjustment of the seat height	
	Foot rest	
6. Posture - standing	How long the person sits	
	Height of the work surface	
	Bending the body forward or backward	
	Time spent standing	
7. Posture - neck, shoulders	Support for the knees, hips, trunk, arms etc.	
	Position of the neck	
8. Posture - elbows, forearms, hands, wrists	Position of the shoulders	
	Position of the elbows and forearms	
9. Posture - other positions/postures	Position of the wrists and hands	
	Twisted posture	
	Prolonged fixed posture	
10. Repetition	Others (kneeling, squatting, lying down)	
	Repetitive motions	



Observation headings	Check out	Applicable?
11. Force - manual materials handling equipment	Adapted/adjustable for work and workers	
12. Force - vibrating tools	Necessary and adapted to the work and worker	
13. Force - wrist and hand strain	Wrist and hand strain/effort	
14. Force - Pushing, pulling with the arms	Effort with the arms to push/pull	
15. Force - lifting: characteristics of the load	Handles	
	Dimensions	
	Sharp edges, rough surfaces, etc.	
16. Force - lifting: starting position	Starting position	
	Horizontal distance for grasping the load	
17. Force - lifting: moving the object	Heights when grasping and dropping the load	
	Travel distance of the load	
18. Force - lifting: frequency & weight	Frequency of lifting	
	Weight	
19. Work environment - general	Temperature	
	Drafts	
20. Work environment - lighting	Reflection	
	Glare	
21. Work organization/stressors - time issues	Time constraints	
	Breaks/rest periods	
	Overtime	
22. Work organization/stressors - other hazards	Production bonuses	
	Job rotation	
23. Summary of observations		

\* Translated and adapted from *Troubles musculosquelettiques du dos et des membres superieurs (TMS). Strategie d'évaluation et de prevention des risques.* (Belgian) Ministere federal de l'Emploi et du Travail. 2002. Also used: materials from <http://www.sobane.be> and J.B. Malchaire and A. Piette, "Co-ordinated strategy of prevention and control of the biomechanical factors associated with the risk of musculoskeletal disorders," *International Archives of Occupational and Environmental Health*, 2002, Vol 75: pgs. 459 - 467.





# 1. Computer or monitor work



How is the work station organized or laid out? Note: For background information, see other side.

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





# 1. Computer or monitor work

Ergonomic  
design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Layout</b>	<p>If accessories - screen/monitor, keyboard, mouse, document holder - are poorly placed, have poor posture, tired muscles and pain in:</p> <ul style="list-style-type: none"><li>• nape of the neck - especially if screen/monitor or document holder is too high or too low</li><li>• shoulder &amp; arms - especially if the keyboard is badly placed</li><li>• wrists &amp; hands - when flexed or twisted or resting on edge of the table</li></ul>	<ul style="list-style-type: none"><li>• Avoid reflections - the screen/monitor should not face a window or have one directly behind it</li><li>• Choose furniture &amp; equipment that allows the person to work with their neck upright, the shoulders relaxed, wrists in neutral position (straight) and elbows at a 90° or more</li><li>• Adapt arrangement of materials for the task:<ul style="list-style-type: none"><li>- document holder facing the person, to let them read the information (e.g. coding work)</li><li>- screen/monitor facing the person where tasks require them to look at it continuously</li></ul></li></ul>

Translated and adapted from SOBANE materials, available at [www.sobane.be/fr/tms\\_obs.html](http://www.sobane.be/fr/tms_obs.html)





## 2. Tools, materials, controls, products



What do you see or notice in terms of:

Note: For background information, see other side.

- visual controls?

- distance required to reach tools/materials/controls/products?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 2. Tools, materials, controls, products

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Visual controls</b>	Position of dials, screens, etc. determines: <ul style="list-style-type: none"> <li>• eye movement</li> <li>• head posture</li> <li>• trunk posture</li> </ul>	Position dials, screens etc. in front of the operator, especially when: <ul style="list-style-type: none"> <li>• they are referred to or used frequently</li> <li>• they are important for safety and production quality</li> </ul> The line of sight must be: <ul style="list-style-type: none"> <li>• slightly below the horizontal plane</li> <li>• directly in front of the operator or slightly to the left or right</li> </ul>
<b>Distance to reach</b>	If too far: <ul style="list-style-type: none"> <li>• awkward postures - extended arms and shoulders, bent back ...</li> <li>• tendon and joint problems</li> <li>• local and general muscle fatigue</li> <li>• back and neck pain</li> </ul>	Position controls, materials and tools: <ul style="list-style-type: none"> <li>• directly in front - if standing, less than 50 cm (20") away ; if sitting, less than 38 cm (15") away</li> <li>• at heart level</li> <li>• less than 60 cm (24") - arm's length away for major or frequently used controls</li> </ul> Never reach behind.  Perform repetitive tasks with shoulders relaxed and elbows bent about 90° or more.

Translated and adapted from SOBANE materials, available at [www.sobane.be/fr/tms\\_obs.html](http://www.sobane.be/fr/tms_obs.html)





### 3. Tools



**What do you see or notice in terms of:** Note: For background information, see other side.

- how suitable/appropriate are the tools for the work and workers?
  
- handle shape?
  
- weight?
  
- controls?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





### 3. Tools



We looked at ...	Why be concerned? (consequences)	Recommendations
<b>If tools are suitable or appropriate for the work &amp; workers</b>	If poorly chosen: <ul style="list-style-type: none"> <li>• overwork, poor postures, shoulder problems</li> <li>• hand injuries, blisters, tendonitis, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Choose the tool that is best suited for the job so that the wrist remains straight and at a normal height</li> <li>• Standardize nuts, bolts, etc. to reduce the number of tools required</li> <li>• Tools that can be used by anyone - women, men, left-handed people</li> <li>• Directly in front of the operator or slightly to the left or right</li> </ul>
<b>Handle shape</b>	If poorly suited: <ul style="list-style-type: none"> <li>• poor arm posture - raised, stretched, twisted; twisted wrist etc.</li> <li>• crushed hands /fingers if too small or sharp-edged</li> <li>• more strength required</li> </ul>	<ul style="list-style-type: none"> <li>• Shaped so the wrist remains straight and the handle fits well in the hand</li> <li>• Handle not too smooth/rough/sharp               <ul style="list-style-type: none"> <li>- wood or metal coated with rubber/plastic</li> <li>- 10 cm to 12 cm (4" - 5") long</li> <li>- diameter of handle about                   <ul style="list-style-type: none"> <li>&gt; 60 mm (2.25") for tools requiring strength</li> <li>&gt; 12 mm (0.5") for precision tools</li> </ul> </li> </ul> </li> <li>• May be used by both left-handed and right-handed people</li> </ul>
<b>Weight</b>	If too heavy: <ul style="list-style-type: none"> <li>• tired arms, cramps, tendonitis and other musculoskeletal problems</li> </ul>	<ul style="list-style-type: none"> <li>• For work requiring strength: between about 1.5 kg (3lb) &amp; 2 kg (4.5lb)</li> <li>• For precision work: between 400 g (0.5 lb) and 1.5 kg (3lb)</li> <li>• For heavier tools/special systems: counterbalanced support devices, elbow rests, etc.</li> </ul>
<b>Controls</b>	If poorly positioned: <ul style="list-style-type: none"> <li>• poor postures</li> </ul> If too stiff: <ul style="list-style-type: none"> <li>• constant exertion and fatigue</li> </ul> If too sensitive: <ul style="list-style-type: none"> <li>• risk of mistakes, incidents, injuries</li> </ul>	<ul style="list-style-type: none"> <li>• Controls that are easy to operate without stress for the fingers, hands, or wrists</li> <li>• Controls that are not too stiff nor too sensitive</li> <li>• May be used by left-handed people</li> </ul>

Translated and adapted from SOBANE materials, available at [www.sobane.be/fr/tms\\_obs.html](http://www.sobane.be/fr/tms_obs.html)







## 4. Work station: obstructions

Ergonomic  
design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Obstructions the workstation</b>	If obstructed: <ul style="list-style-type: none"><li>• poor work postures</li><li>• fatigue and back pain</li><li>• less precise moves/control</li><li>• increased risk of hitting something or being injured</li></ul>	<ul style="list-style-type: none"><li>• Have a clear access path that is 60 cm - 80 cm (24" - 31.5") wide</li><li>• Provide at least 1 m (39") clear space in front of &amp; behind station</li><li>• Provide sufficient and adequate storage space</li><li>• Keep work station and work surfaces clean and tidy</li></ul>
<b>Obstructions under the work surface</b>	<ul style="list-style-type: none"><li>• Crossing legs impossible</li><li>• Static posture of feet and legs</li><li>• Fatigue</li></ul>	Pay attention to recommendations about leg and foot room for seated workstations: <ul style="list-style-type: none"><li>• height for a desk - 65 cm (25.5"); typing - 60 cm (24")</li><li>• knee room - 58 cm (23") wide</li><li>• depth - 60 cm (24")</li></ul> Do not store things under the work surface.

Translated and adapted from SOBANE materials, available at [www.sobane.be/fr/tms\\_obs.html](http://www.sobane.be/fr/tms_obs.html)





## 5. Posture - sitting

Ergonomic  
design

**What do you see in terms of:**

Note: For background information, see other side.

- the height of the work surface in relation to the worker?
  
- the quality of the seat/chair?
  
- back support?
  
- how the seat height is adjusted?
  
- foot rest?
  
- how long the person sits?

**In conclusion, the current situation**

**is acceptable**

**needs improvement**

**What *specific* improvements can be made?**

**Should we analyze the situation or the proposed solutions in more detail?**

**no**

**yes - more detail  
on other side**





## 5. Posture - sitting

Ergonomic  
design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Height of the work surface</b>	If badly adjusted: <ul style="list-style-type: none"><li>• bad postures</li><li>• extended arms &amp; rounded back</li><li>• difficult movements</li></ul>	Adjust the work surface depending on the task: <ul style="list-style-type: none"><li>• support forearms: a few cm/inches above elbows</li><li>• industrial work that requires free arm movements: 5 to 15 cm (2" - 6") below the elbows</li><li>• computer or typing work: keyboard sloping away and slightly below the elbow is best</li></ul>
<b>Chair quality</b>	If it's not good: <ul style="list-style-type: none"><li>• poor postures</li><li>• compressed thighs or under the knees</li><li>• poor stability</li><li>• difficult movements</li></ul>	Choose a chair with these features: <ul style="list-style-type: none"><li>• adjustable height and back</li><li>• seat pan large enough to allow movement</li><li>• seat pan slightly tilted towards the front (2° - 5°)</li><li>• rotation and casters, with 5 spokes</li><li>• seat and back padding about 2.5 cm (1")</li></ul>
<b>Back support</b>	If there's none or a poor support, the spine is not supported and back problems	Chair with lumbar support just above the hips (fit "S" curve of back, not at hips) which can be used whatever the task so the spinal column remains upright.
<b>Seat height adjustment</b>	If too high or too low: <ul style="list-style-type: none"><li>• back &amp; neck flexed</li><li>• thighs compressed</li><li>• poor posture for shoulders &amp; arms</li></ul>	Adjust the height of the work surface to have: <ul style="list-style-type: none"><li>• thighs horizontal or slanted down</li><li>• legs vertical or extended/slanted down</li><li>• feet flat on the floor or supported</li></ul> <p>Train the person to adjust the height of the seat and back according to person's height</p>
<b>Foot support</b>	For short people avoid compression under the knees	Provide a support: <ul style="list-style-type: none"><li>• surface (length x width): 30 cm x 40 cm (12" x 16")</li><li>• incline an angle of close to 10° </li><li>• important support does not move</li></ul>
<b>Time in seated position</b>	If too long, poor posture (flexed neck) are maintained for too long	Organize work to allow getting up and/or alternating between standing and sitting positions

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## 6. Posture - standing



What do you see or notice in terms of:

Note: For background information, see other side.

- the height of the work surface?
  
- bending the body backward or forward?
  
- the amount of time spent standing?
  
- supports for knees, hips, trunk, arms, etc.?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the detail

no

yes - more





## 6. Posture - standing



We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Height of the work surface</b>	If poor: <ul style="list-style-type: none"> <li>• raised shoulders, bent back or neck</li> <li>• general and local fatigue</li> </ul>	Adjust the height of the work surface to the size of the operator and according to the task and the type of work: <ul style="list-style-type: none"> <li>• precision work - 95 cm - 110 cm (37.5" - 43")</li> <li>• light work - 85 cm - 95 cm (33.5" - 37.5")</li> <li>• heavy work - 70 cm - 90 cm (27.5" - 35.5")</li> </ul>
<b>Bending the body backward or forward</b>	Sooner or later, bending leads to: <ul style="list-style-type: none"> <li>• back muscle fatigue</li> <li>• compressed discs in the spine</li> <li>• back pain</li> </ul>	<ul style="list-style-type: none"> <li>• Position controls, tools, equipment within easy reach of the operator</li> <li>• Maintain the same height throughout the entire production circuit</li> <li>• Provide space for feet at the base of the work surface so the operator can get close to what they are working on</li> <li>• For loads that have to be gripped or moved, position them at a height of more than 60 cm (24")</li> </ul>
<b>Amount of time spent standing</b>	Prolonged standing leads to: <ul style="list-style-type: none"> <li>• swelling of the legs &amp; varicose veins</li> <li>• back and neck fatigue &amp; pain</li> <li>• increased blood pressure</li> </ul>	<ul style="list-style-type: none"> <li>• Provide a sit-stand stool, with room for knees and feet to fit under the work station/surface</li> <li>• Allow for work periods where workers can walk and sit down</li> </ul>
<b>Supports for knees, hips, trunk, arms ...</b>	Local supports can reduce: <ul style="list-style-type: none"> <li>• muscular strain</li> <li>• leg and back pain</li> </ul>	<ul style="list-style-type: none"> <li>• Put a hip rest at the edge of the work surface</li> <li>• Position a hand grip where workers can hold onto it with one hand for high working surfaces</li> <li>• Vary working positions to avoid constant leaning</li> <li>• Never lean against a sharp edge</li> </ul>

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## 7. Posture - neck and shoulders

Ergonomic  
design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Neck position</b>	If neck is bent forward (inclined), back (flexed) or to either side: <ul style="list-style-type: none"><li>• muscle fatigue/soreness</li><li>• pain &amp; stiffness/tight feeling</li><li>• may injure tendons, muscle or vertebrae in the neck</li></ul>	Train people so they: <ul style="list-style-type: none"><li>• pivot the chair to look to the side</li><li>• relax and support their back against the chair</li><li>• keep the work surface at a height so they can work with their neck straight</li><li>• use the document holder/reader placed at the same height as the screen/monitor</li><li>• take regular short breaks</li><li>• change posture and relax the neck regularly</li></ul>
<b>Shoulder position</b>	If the shoulders are rotated or are raised during work: <ul style="list-style-type: none"><li>• muscle fatigue/soreness</li><li>• pain in the shoulders and arms</li><li>• joint &amp; tendon injuries</li></ul> Working with the arms above the shoulders: <ul style="list-style-type: none"><li>• extending the trunk forward</li><li>• pain in the shoulders and arms</li><li>• less precise control</li></ul>	<ul style="list-style-type: none"><li>• Prevent and do not have activities where:<ul style="list-style-type: none"><li>- hands are above the level of the heart</li><li>- arms extended forward without support</li><li>- arms spread apart or towards the front</li><li>- shoulders are rotated</li></ul></li><li>• Have enough space so people can pivot or swirl when moving their feet</li><li>• Put materials, products, tools being used etc. within easy reach of the hands</li><li>• If it's necessary to reach for something that is higher:<ul style="list-style-type: none"><li>- use a platform or stool that is light and easy to move</li><li>- train workers to keep a hand on a fixed support at the height</li></ul></li></ul> <p>In some situations, the forearms can be suspended when doing repetitive static work. This is restrictive and should be avoided as much as possible.</p>

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## 8. Posture - elbows, forearms, hands & wrists



What do you see or notice in terms of:

Note: For background information, see other side.

- the position of the elbows and forearms?

- the position of the hands and wrists?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 8. Posture - elbows, forearms, hands & wrists



We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Position of the elbows and forearms</b>	<p>If the arms are pressed against a surface or the sharp edge of a table:</p> <ul style="list-style-type: none"><li>• compression of the nerves &amp; tendons</li><li>• pain &amp; tingling feelings</li></ul> <p>If there is frequent rotation of the forearms:</p> <ul style="list-style-type: none"><li>• inflammation of the tendons (epicondylitis, a.k.a. tennis or golfers' elbow)</li></ul>	<ul style="list-style-type: none"><li>• Provide support for the elbows when doing work that involves data entry, typing or using the mouse</li><li>• Remove tasks that force the forearms to rotate</li><li>• If the forearms must be extended, provide support for the elbows.</li><li>• Round off edges of tables, desks and benches if people are leaning elbows &amp; forearms on them</li><li>• Use tools that allow the forearm to be bent at about 90° or more</li></ul>
<b>Position of the hands and wrists</b>	<p>If the hands or wrists are always flexed (not in a neutral position):</p> <ul style="list-style-type: none"><li>• friction of the nerves and tendons</li><li>• less force possible</li><li>• makes the task more tiring and difficult</li></ul>	<ul style="list-style-type: none"><li>• Bring materials and tools closer to the worker</li><li>• Choose tools that have bent handles so that the wrists can be straight</li><li>• Put the task at an angle</li><li>• Organize the work so workers can change positions</li><li>• Provide wrist supports</li><li>• Round the edges of work surfaces</li></ul>

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## 9. Posture - other positions/postures

Ergonomic design

What do you see in terms of:

Note: For background information, see other side.

- a twisted posture/position?
  
  
  
- prolonged posture/position?
  
  
  
- other postures/positions: kneeling, squatting, lying down?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 9. Posture - other positions/postures

Ergonomic design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Twisted posture or position</b>	If the back or trunk is twisted: <ul style="list-style-type: none"><li>• muscle fatigue</li><li>• back problems</li></ul>	<ul style="list-style-type: none"><li>• Rotating and moveable chairs:</li><li>• Products/objects and orders facing the person</li><li>• Use pivoting conveyors or tables whenever the product or object changes direction</li></ul>
<b>Prolonged (i.e. static) postures or positions</b>	A prolonged and fixed or static posture involves: <ul style="list-style-type: none"><li>• fatigue for the contracted muscles (static load)</li><li>• overloading joints and tendons</li></ul>	<ul style="list-style-type: none"><li>• Alternate with tasks allowing movement</li><li>• Reduce continuous muscular efforts (static positions)</li><li>• Provide elbow supports, padded to level of the chair</li><li>• Avoid keeping arms in the air or the body leaning forward</li><li>• Avoid:<ul style="list-style-type: none"><li>- high effort for more than 10 seconds</li><li>- moderate effort for more than 1 minute</li><li>- low effort for more than 4 minutes</li></ul></li></ul>
<b>Other postures or positions</b>	<ul style="list-style-type: none"><li>• Tired legs</li><li>• Problems for hips, knees, ankles</li><li>• Losing balance and chance of falling</li></ul>	<ul style="list-style-type: none"><li>• Keep materials, products &amp; tools within easy reach</li><li>• Organize the work area so the person can work seated or standing</li><li>• Layout loads so they can be handled at a height between 70 cm - 80 cm (27" - 31") above floor</li><li>• Foresee/be aware of stable support points</li></ul>

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# 10. Repetition



What do you notice about repetitive motions? Note: For background information, see other side.

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 10. Repetition

Ergonomic  
design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Repetition</b>	<p>No recovery time for repetitive tasks leads to:</p> <ul style="list-style-type: none"><li>• A build-up of muscle and tendon strain and fatigue</li><li>• A loss of precision</li><li>• A drop in alertness, increasing the risk of incidents causing injury and damage</li></ul>	<ul style="list-style-type: none"><li>• Reduce the work pace whenever possible</li><li>• Design the job so that each arm or hand can be used in turn (alternated)</li><li>• Arrange for frequent rotations between workstations that require different postures and effort (note: studies say that if workers' backs may be affected by the tasks, this may not be a very effective "fix")</li><li>• Arrange for short, frequent breaks (5 minutes per hour)</li><li>• Provide pneumatic or electric tools for the most repetitive tasks</li><li>• With the operators, examine how repetitive tasks can best be done to minimize effort and posture strain</li><li>• Teach this technique to everyone</li></ul>

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# 11. Force - manual material handling equipment



What do you notice about manual material handling equipment?

Note: For background information, see other side.

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 11. Force - manual material handling equipment

Ergonomic design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Material handling equipment</b>	Proper material handling equipment reduces: <ul style="list-style-type: none"><li>• awkward posture</li><li>• muscular strain</li><li>• consequently reduces arm, neck, and back problems</li></ul>	<ul style="list-style-type: none"><li>• Use mechanical equipment in the following situations:<ul style="list-style-type: none"><li>- When weight involved is more than 15 kg (33 lbs.)</li><li>- Carrying distance is more than 10 m (30')</li><li>- Lifting is done more than several times per hour</li></ul></li><li>• Carefully select the equipment (e.g. hoists, forklifts); poorly-designed equipment will not be used</li><li>• Select equipment according to the weight of the load and the frequency of handling, and the needs of those who will use it</li></ul>

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## 12. Force - vibrating tools



Are vibrating tools absolutely necessary?

Note: For background information, see other side.

Are they suited for the work and the workers?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 12. Vibrating tools

Ergonomic design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Vibrating tools</b>	Vibration leads to: <ul style="list-style-type: none"><li>• limited mobility and joint pain (hands, elbows) typical of impact hammers, pneumatic drills, power chisels etc.</li><li>• whitening of fingers when exposed to cold (a.k.a. Reynaud's disease or vibration white finger)</li><li>• tingling, numbness</li></ul>	<ul style="list-style-type: none"><li>• Use the machine or tool that is best suited for the task/job</li><li>• Maintain machines or tools on a regular basis (sharpening)</li><li>• Handles<ul style="list-style-type: none"><li>- provide anti-vibration handles</li><li>- coat contact surfaces with rubber, felt, cork, etc.</li><li>- hold the machine only by the handles</li><li>- use gloves that fit the worker (not too bulky or too thin)</li></ul></li><li>• Improve postures and reduce strain:<ul style="list-style-type: none"><li>- support the tool with a counter-weight</li><li>- adjust the height of the work surface</li><li>- train the operator to make the best use of the tool, using as little grip force and pressure as possible</li><li>- immobilize the items that are being tooled</li></ul></li><li>• Organize the work differently:<ul style="list-style-type: none"><li>- limit the time for using vibrating tools</li><li>- increase the number of rest periods</li><li>- alternate work with non-vibrating tools</li></ul></li></ul>

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### 13. Force - wrist and hand strain



What do you notice about wrist and hand strain/effort?

Note: For background information, see other side.

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 13. Force - wrist and hand strain

Ergonomic design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Position of the wrist and hand</b>	<p>When force exerted is high (tightening, squeezing, etc.) or low but sustained (keyboard, mouse, etc.):</p> <ul style="list-style-type: none"><li>• fatigue</li><li>• joint problems</li></ul> <p>When the heel of the hand is used as a hammer or for squeezing:</p> <ul style="list-style-type: none"><li>• compressed tendons, nerves, blood vessels</li><li>• carpal tunnel syndrome, among others</li></ul>	<ul style="list-style-type: none"><li>• Reduce the following to a minimum:<ul style="list-style-type: none"><li>- tightening and squeezing</li><li>- exerting sudden force</li><li>- fine grasping with the fingers (pinch grip)</li><li>- using the heel of the hand as a hammer</li></ul></li><li>• Assess the need to tighten “to the max” (avoid as best as possible)</li><li>• Provide technical aids (types of couplings, sealing rings, etc.)</li><li>• Provide tools with long enough handles</li><li>• Provide hydraulic or electric tools</li><li>• Carry objects (files) in containers with handles to avoid pinching the fingers</li><li>• Use pliers or failing that, the whole hand, to grasp small objects, rather than the fingers which can only grip them (and use more force in the process)</li><li>• Provide regular breaks, even when minor effort is sustained</li></ul>

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# 14. Force - pushing/pulling with arms



What do you notice about strain from pushing or pulling with arms?

Note: For background information, see other side.

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 14. Force - pushing/pulling with arms



We looked at ...	Why be concerned? (consequences)	Recommendations
<p><b>Strain from pushing and pulling with the arms</b></p>	<p>Using a cart leads to:</p> <ul style="list-style-type: none"> <li>• Reduced muscular strain and problems</li> </ul> <p>But an increased risk of:</p> <ul style="list-style-type: none"> <li>• Getting fingers and hands caught</li> <li>• Injuring feet and legs</li> <li>• Dislocating arm, shoulder, or back joint</li> </ul>	<ul style="list-style-type: none"> <li>• Provide:           <ul style="list-style-type: none"> <li>- 2, 3, or 4-wheeled handcarts for loads up to 200 kg (440 lb)</li> <li>- Hand dollies for loads under 700 kg (1550 lb)</li> <li>- Maximum use: 200 times per work day</li> <li>- Carrying distance under 35 m (115')</li> <li>- Motorized carts or conveyers for heavy loads to be moved over long distances</li> </ul> </li> <li>• Ensure that the floor is not slippery or uneven</li> <li>• Reduce friction of rolling surfaces</li> <li>• Provide 4 large-diameter, wide, low-friction wheels</li> <li>• Provide a handle slightly above elbow height</li> <li>• Reduce the load if it must be pushed or pulled           <ul style="list-style-type: none"> <li>- with the hands above shoulder level or below waist level</li> <li>- or for more than 5 seconds</li> <li>- or when the object is not directly in front</li> </ul> </li> <li>• Reduce the distance to be covered by bringing the stock area closer, for instance</li> <li>• Push rather than pull</li> <li>• Provide non-slip shoes</li> </ul>

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## 15. Force - characteristics of the load



What do you see or notice in terms of:

Note: For background information, see other side.

- handles?
  
  
  
- dimension of the load?
  
  
  
- edges that can cut, rough surfaces etc.?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 15. Force - characteristics of the load

Ergonomic design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Handles</b>	If there are handles: <ul style="list-style-type: none"><li>• easier to hold</li><li>• less likely to fall or drop</li></ul>	<ul style="list-style-type: none"><li>• Put handles on objects that weigh more than 4.5 kg (10 lbs)</li><li>• Put handles for two people if weight is more than 18 kg (40 lbs)</li><li>• Position handles below or at height of centre of gravity</li><li>• Handles:<ul style="list-style-type: none"><li>- should be slightly rough</li><li>- round/oval shape, diameter 19 to 38 mm ( " to 1 ")</li><li>- 115 mm (4 ") long</li><li>- free space of 50 mm (2") or 75 mm (3") if wearing gloves</li></ul></li></ul>
<b>Load dimensions</b>	If it's large: <ul style="list-style-type: none"><li>• reduces field of vision</li><li>• likely to fall or run into things</li><li>• muscle strain</li><li>• may cause back problems</li></ul>	<ul style="list-style-type: none"><li>• Limit load or objects to a maximum of:<ul style="list-style-type: none"><li>- 60 cm wide, 35 cm high, 40 cm deep (24" wide, 14" high, 16" deep)</li></ul></li><li>• Use mechanical aids for awkward or large loads</li></ul>
<b>Cutting edges, rough surfaces</b>	If object has cutting edges or rough surfaces: <ul style="list-style-type: none"><li>• may get local cuts and abrasions</li><li>• precise gestures are more difficult</li></ul>	<ul style="list-style-type: none"><li>• Remove edges that can cut or surfaces that are rough on the skin</li><li>• Wrap/box/bag dangerous objects</li><li>• Package loads that are too hot, cold or dirty</li><li>• Use protective gloves as a last resort</li><li>• Protect hands from heat and cold</li><li>• Handles/grips should be made of plastic, rubber or wood</li></ul>

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## 16. Force - lifting: starting position

Ergonomic design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Starting posture</b>	A poor starting posture: <ul style="list-style-type: none"><li>• requires more muscle power</li><li>• overloads joints in the arms and spine</li><li>• increases the chances of incidents or injuries from running into things or people, cuts, or burns</li></ul>	For small, compact loads: <ul style="list-style-type: none"><li>• hold load as close to body as possible</li><li>• starting posture: comfortable, in position that allows holding the load close to the body - back can be bent (if lifting from floor especially)</li><li>• place feet on both sides of the load, if possible</li><li>• put one foot forward in the direction the load is to be moved</li><li>• lift using leg muscles, if possible</li><li>• avoid lifting from below knees and above shoulders</li></ul> For larger loads: <ul style="list-style-type: none"><li>• find another person to assist/help or use devices such as hand trucks, hoists, forklifts</li></ul>
<b>Horizontal distance for grasping the load</b>	A load that is farther away from the body: <ul style="list-style-type: none"><li>• requires more effort</li><li>• tires arms and back</li><li>• causes back problems</li></ul>	<ul style="list-style-type: none"><li>• Hold load as close to body as possible</li><li>• Remove all obstacles in travel path</li><li>• Reduce the size of the load</li><li>• Use mechanical lifting devices if load is bulky or heavy</li></ul>

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## 17. Force - lifting: moving the object

Ergonomic design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Travel distance for the load</b>	<p>The greater the distance:</p> <ul style="list-style-type: none"> <li>• the greater the muscle fatigue</li> <li>• the greater the risk of falling</li> </ul>	<ul style="list-style-type: none"> <li>• Carry the load with both hands</li> <li>• Limit the carry distance to 2 m (6')</li> <li>• Reduce the weight of loads and daily tonnage if distance is between 2 m and 10 m (6' to 30')</li> <li>• Use mechanized transport equipment when distance is more than 10 m (30')</li> <li>• Use sliding tables, conveyors belts, ball casters</li> <li>• Eliminate changes in heights between work surfaces</li> </ul>
<b>Heights when grasping or putting down the load</b>	<p>If the object is too high up:</p> <ul style="list-style-type: none"> <li>• leaning backward with arms raised</li> <li>• back and shoulder problems</li> </ul>	<ul style="list-style-type: none"> <li>• Grasping and dropping points should be on the same vertical height as much as possible, to reduce twisting</li> <li>• Move the start and finish points away from each other to force workers to turn their whole body or take a step, rather than twist at the waist</li> <li>• If the load dimensions are always the same, provide support ideally at 750 mm (30") but between 60 and 90 cm (24" and 36")</li> <li>• If load dimensions vary, provide adjustable height supports (e.g. lift table)</li> <li>• Completely avoid positions at ground level or above shoulder level</li> <li>• Provide mechanized lifting equipment for objects placed above shoulder level</li> <li>• Arrange storage areas taking into account the following: <ul style="list-style-type: none"> <li>- height of workers - usually between 80 &amp; 175 cm (31.5" and 69")</li> <li>- weight of objects: <ul style="list-style-type: none"> <li>&gt; loads over 10 kg (22 lbs) at hip level</li> <li>&gt; lighter loads between knees &amp; shoulder level</li> </ul> </li> <li>- reaching distance: place frequently-lifted objects closer to the worker</li> </ul> </li> </ul>

Translated and adapted from SOBANE materials, available at [www.sobane.be/fr/tms\\_obs.html](http://www.sobane.be/fr/tms_obs.html)





## 18. Force - lifting: frequency and weight



What do you see or notice in terms of:

Note: For background information, see other side.

- frequency of lifting?

- weight?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





# 18. Force - lifting: frequency and weight



We looked at ...	Why be concerned? (consequences)	Recommendations																																																						
<p><b>Frequency of lifting</b></p>	<p>If lifting is frequent:</p> <ul style="list-style-type: none"> <li>• general fatigue</li> <li>• local muscle fatigue</li> <li>• movements less coordinated</li> </ul>	<ul style="list-style-type: none"> <li>• Limit lifting frequency to less than once per 5 minutes, if possible</li> <li>• Use mechanical aids if loads are heavy, hard to handle, or lifted often</li> </ul> <p>If loads are lifted frequently:</p> <ul style="list-style-type: none"> <li>• store heavy loads (more than 10 kg/22 lbs) at hip level</li> <li>• store light objects between 60 cm/24" (knee level) and 150 cm/60" (shoulder level)</li> </ul>																																																						
<p><b>Weight</b></p>	<p>Maximum weight depends on lifting conditions - all the factors reviewed above. If high, the likelihood of incidents and of back or hand/arm problems goes up quickly</p>	<ul style="list-style-type: none"> <li>• Display weights on loads</li> <li>• For occasional lifting straight ahead with a good grasp and over a distance of 70 cm/28", lift loads with a recommended top weight of less than:</li> </ul> <table border="1" data-bbox="789 1020 1382 1293"> <thead> <tr> <th colspan="2"></th> <th colspan="3">Distance of hands from body</th> </tr> <tr> <th colspan="2"></th> <th>20 cm</th> <th>35 cm</th> <th>50 cm</th> </tr> </thead> <tbody> <tr> <th rowspan="4">Grip height</th> <th>40 cm</th> <td>19 kg</td> <td>11 kg</td> <td>8 kg</td> </tr> <tr> <th>75 cm</th> <td>22 kg</td> <td>12 kg</td> <td>9 kg</td> </tr> <tr> <th>100 cm</th> <td>20 kg</td> <td>11 kg</td> <td>8 kg</td> </tr> <tr> <th>140 cm</th> <td>17 kg</td> <td>10 kg</td> <td>7 kg</td> </tr> </tbody> </table> <table border="1" data-bbox="789 1346 1382 1619"> <thead> <tr> <th colspan="2"></th> <th colspan="3">Distance of hands from body</th> </tr> <tr> <th colspan="2"></th> <th>8 "</th> <th>14 "</th> <th>20 "</th> </tr> </thead> <tbody> <tr> <th rowspan="4">Grip height</th> <th>16 "</th> <td>42 lb</td> <td>24 lb</td> <td>18 lb</td> </tr> <tr> <th>30 "</th> <td>48 lb</td> <td>26 lb</td> <td>20 lb</td> </tr> <tr> <th>40 "</th> <td>44 lb</td> <td>24 lb</td> <td>18 lb</td> </tr> <tr> <th>55 "</th> <td>37 lb</td> <td>22 lb</td> <td>15 lb</td> </tr> </tbody> </table>			Distance of hands from body					20 cm	35 cm	50 cm	Grip height	40 cm	19 kg	11 kg	8 kg	75 cm	22 kg	12 kg	9 kg	100 cm	20 kg	11 kg	8 kg	140 cm	17 kg	10 kg	7 kg			Distance of hands from body					8 "	14 "	20 "	Grip height	16 "	42 lb	24 lb	18 lb	30 "	48 lb	26 lb	20 lb	40 "	44 lb	24 lb	18 lb	55 "	37 lb	22 lb	15 lb
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# 19. Work environment - general



What do you see or notice in terms of:

Note: For background information, see other side.

- temperature?

- drafts?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 19. Work environment - general

Ergonomic  
design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Temperatures</b>	If too cold: <ul style="list-style-type: none"><li>• stronger muscle contractions</li><li>• less strength</li><li>• less co-ordination</li></ul> If too hot: <ul style="list-style-type: none"><li>• excessive sweating</li><li>• fatigue</li><li>• slippery hands</li></ul>	<ul style="list-style-type: none"><li>• Reduce gain or loss of heat to outside</li><li>• Reduce internal gain or loss of heat -<ul style="list-style-type: none"><li>- caulk hot and cold surfaces (ducts, walls, etc.)</li><li>- vent warm and humid gases at source</li><li>- eliminate all water and vapour leaks</li></ul></li><li>• Adapt clothing to conditions</li><li>• Keep temperatures above the following minimums:<ul style="list-style-type: none"><li>- very light work      20° C</li><li>- light work              18° C</li><li>- semi-heavy work      15° C</li><li>- heavy work              12° C</li></ul></li></ul>
<b>Drafts</b>	If drafty: <ul style="list-style-type: none"><li>• local chills</li><li>• muscle contractions, neuralgia</li></ul>	<ul style="list-style-type: none"><li>• Limit air speeds to:<ul style="list-style-type: none"><li>- 10 m/sec for short-term exposure</li><li>- 3 m/sec for intermittent work</li><li>- 1 m/sec for prolonged standing or heavy work</li><li>- 0.5 m/sec for prolonged sitting work</li></ul></li><li>• Eliminate all drafts on the face or neck</li></ul>

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## 20. Work environment - lighting

Ergonomic  
design

What do you see or notice in terms of:

Note: For background information, see other side.

- reflection?

- glare?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail  
on other side





## 20. Work environment - lighting

Ergonomic  
design

We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Lighting: reflection and glare</b>	Poor lighting leads to: <ul style="list-style-type: none"><li>• poor vision</li><li>• reflection and glare</li><li>• poor work posture</li><li>• difficulty seeing dangerous objects/elements</li><li>• higher chance of incidents causing injury and damage</li></ul>	<ul style="list-style-type: none"><li>• Provide lighting based on the degree of perception/visibility needed, the size and contrast of objects to be handled, tool detail, etc.</li><li>• Eliminate all shiny surfaces (e.g. polished metal, glass, plastic sheeting, etc.)</li><li>• Provide even lighting on work surfaces</li><li>• Avoid major shadows and contrast</li><li>• Increase lighting on dangerous objects and elements</li><li>• Clean and maintain light fixtures on a regular basis</li></ul>

Translated and adapted from SOBANE materials, available at [www.sobane.be/fr/tms\\_obs.html](http://www.sobane.be/fr/tms_obs.html)





## 21. Work organization/stressors - time issues



What do you notice about:

Note: For background information, see other side.

- time constraints?
  
  
  
- breaks/rest periods?
  
  
  
- overtime?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 21. Work organization/stressors - time issues



We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Time constraints</b>	Time constraints lead to: <ul style="list-style-type: none"> <li>• Going beyond one's physiological limits more often</li> <li>• Local and general fatigue</li> <li>• Increased chance of incidents</li> <li>• Quick and abrupt movements</li> <li>• Increased effort</li> <li>• Sustained work without breaks</li> </ul>	<ul style="list-style-type: none"> <li>• Adapt organization and technical procedures to limit the frequency of rush situations</li> <li>• Assign tasks so that help can be available in rush situations</li> <li>• Assign a set of tasks to a group of people</li> <li>• Avoid factors that increase the work pace, particularly:               <ul style="list-style-type: none"> <li>- tight or frequently changing deadlines</li> <li>- constant electronic monitoring of productivity</li> </ul> </li> </ul>
<b>Breaks/rest periods</b>	Lack of regular breaks or rests leads to: <ul style="list-style-type: none"> <li>• Poor posture and slower pace of work</li> <li>• Local and general muscular fatigue</li> <li>• Unco-ordinated breaks</li> </ul>	<ul style="list-style-type: none"> <li>• Studies say letting individuals choose when they need breaks reduces musculoskeletal injuries but not output</li> <li>• For heavy work: Mandatory breaks spread throughout the day</li> <li>• For moderate mental and physical effort:               <ul style="list-style-type: none"> <li>- a 10- to 15- minute morning and afternoon break</li> </ul> </li> <li>• When the pace is set by a machine:               <ul style="list-style-type: none"> <li>- a 3- to 5- minute break every hour</li> </ul> </li> </ul>
<b>Overtime</b>	Working overtime leads to: <ul style="list-style-type: none"> <li>• Local and general fatigue</li> <li>• Increased effort</li> <li>• Slower reaction times</li> <li>• Increased risk of incidents</li> <li>• Poorer performance and productivity</li> </ul> And, over time, a higher chance of: <ul style="list-style-type: none"> <li>• Isolation from family and friends</li> <li>• more injuries in general and MSIs in particular</li> <li>• poor life-work balance</li> <li>• weight gain</li> <li>• job strain/toxic stress</li> </ul>	<ul style="list-style-type: none"> <li>• Have enough staff on hand to cover production or activity peaks</li> <li>• Reduce overtime:               <ul style="list-style-type: none"> <li>- hire extra staff during extra busy production periods</li> <li>- modify the job design (e.g. going from 2 to 3 positions etc.)</li> </ul> </li> <li>• Upon hiring, warn of the likelihood of overtime</li> <li>• Give plenty of advance warning when overtime will be required</li> <li>• Increase the length of the work day rather than the number of work days per week (but avoid going to more than 10 hours a day regularly)</li> </ul>

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## 22. Work organization/stressors - other hazards



What do you notice about:

Note: For background information, see other side.

- production bonuses?

- job rotation?

In conclusion, the current situation

is acceptable

needs improvement

What *specific* improvements can be made?

Should we analyze the situation or the proposed solutions in more detail?

no

yes - more detail on other side





## 22. Work organization/stressors - other hazards



We looked at ...	Why be concerned? (consequences)	Recommendations
<b>Production bonuses</b>	Productivity incentives lead to: <ul style="list-style-type: none"><li>• A faster pace of work</li><li>• Increased fatigue</li><li>• Adverse work conditions, more injuries</li></ul>	<ul style="list-style-type: none"><li>• Eliminate production or risk-incentive bonuses</li><li>• Give priority to health and safety, while respecting operators' interests and productivity constraints</li><li>• If there are bonuses, integrate them permanently into the wages, while minimizing the stressors</li></ul>
<b>Job rotation</b>	Lack of rotation leads to: <ul style="list-style-type: none"><li>• Constant posture, movements, and strain</li><li>• Monotony and a decline in alertness</li><li>• Increased risk of incidents</li></ul>	<ul style="list-style-type: none"><li>• Enhance staff flexibility and versatility</li><li>• Organize the work so that:<ul style="list-style-type: none"><li>- the same task is performed for less than an hour</li><li>- two or more tasks using different muscle groups are alternated (being careful to provide rest for the back)</li></ul></li></ul>

Translated and adapted from SOBANE materials, available at [www.sobane.be/fr/tms\\_obs.html](http://www.sobane.be/fr/tms_obs.html)



## 23. Summary of observations

Work station/job: \_\_\_\_\_ Done by: \_\_\_\_\_

Date: \_\_\_\_\_ Date: \_\_\_\_\_

Observation headings	Item	Current situation		Future situation (after quick fixes)	
	Not applicable	Acceptable	Needs improvement	Acceptable	Needs more analysis
1. Computer or monitor work					
2. Tools, materials, controls, products					
3. Tools					
4. Work station - obstructions					
5. Posture - sitting					
6. Posture - standing					
7. Posture - neck, shoulders					
8. Posture - elbows, forearms, hands, wrists					
9. Posture - other positions/postures					
10. Repetition					
11. Force - manual materials handling equipment					
12. Force - vibrating tools					
13. Force - wrist and hand strain					
14. Force - pushing, pulling with the arms					
15. Force - lifting: characteristics of the load					
16. Force - lifting: starting position					
17. Force - lifting: moving the object					
18. Force - lifting: frequency & weight					
19. Work environment - general					
20. Work environment - lighting					
21. Work organization/stressors - time issues					
22. Work organization/stressors - other hazards					



Assessment of prevention measures and planned improvements

- Review the proposed changes in each heading
- Exactly who will do what and when?
  - When will the implementation be planned?
  - When will the change be **done**? (compliance monitoring)
- In order of priority

Who	What	When	
		Planning	Done



**Need more in-depth analysis**, taking into account:

- the effectiveness of prevention or improvement measures described below
- hazards that may result from implementing the improvements
- in terms of urgency and goals









# Guidelines for completing the INCIDENT INVESTIGATION REPORT FORM

## What is the purpose of investigating incidences?

Investigating incidences is an important tool for making a healthier and safer work environment. Incidents are preventable! By determining the causes of an incident, the health and safety committee can identify the reasons why the incident occurred and make recommendations to prevent it happening again. Incidents do not occur as unrelated events and there are always reasons why one occurs. The investigation needs to find the underlying causes so effective solutions can be made.

## Reporting "serious incidents" to the Workplace Safety & Health Division

When a "serious incident" occurs at a workplace, by regulation, the employer is required to report to the Workplace Safety & Health Division as soon as possible. A "serious incident" includes events that result in death or serious injury (see definition below); collapse or structural failure of a building, tower, crane, hoist, temporary construction support system or excavation; uncontrolled spill or escape of toxic, corrosive or explosive substance; an explosion, fire or flooding.

## Terms

minor injury - an employment injury or occupational illness where medical treatment is given but there is no lost time from work other than the day of the occurrence is experienced.

serious injury - fracture of a major bone; amputation; loss of sight; internal hemorrhage; third degree burns; unconsciousness resulting from concussion, electrical contact, asphyxiation; poisoning; cuts, injuries or work-related illnesses requiring hospitalization or time off work; an injury resulting in paralysis; any other injury likely to endanger life or cause permanent disability.

equipment/property damage - incidents that result only in damage to tools, equipment, machinery, vehicles, buildings and facilities.

spill/environmental damage - releases of liquids, solids and gases in the workplace or ones that result in pollution of soil, air and/or water on or around the location of the workplace.

fire - any fire that requires or results in the use of fire suppression equipment or requires the evacuation of a work area.

near-miss - an unplanned event that causes little or no property damage, but had the potential to cause major damage and/or injury.

other - could include incidents such as vehicle collisions, activation of a fall protection system, inadvertent immersion in water, high winds and other environmental conditions, temperature extremes, toxic substances or conditions.

## Occurrence

Location of occurrence - describe where the incident happened; be specific.

Day of week - if employee's work week starts on a day other than Monday, it should be noted and could be part of the "analysis" section. If the incident occurred on overtime, this again could be discussed in the "analysis". Other conditions that may have an impact and should be considered in

the "analysis" section include if incident occurs within days after switching on and off daylight saving time; the employee is returning from a lengthy absence from the workplace - holidays; employee has rotating shifts.

Weather conditions - include amount of cloud, temperature, wind speed, precipitation, if incident is outside or affected by these conditions.



## Particulars of injured employee

Amount of experience in job - how much experience does the employee have doing the particular task/job at time of incident.

Describe injury - explain type of injury/injuries and where located. If involving fingers explain which finger(s) were injured and where. Show location of injury on the body map.

Direct cause of injury - describe only the immediate cause of the injury/injuries. Why the condition(s)

existed for the incident to take place will be discussed in the "analysis".

Name of witness(es) - when gathering information and interviewing witnesses about the incident, make sure to emphasize that their information is confidential and also there can be no discriminatory action taken against them under the *Workplace Safety & Health Act*, sec. 42(1)(c).

## Particulars of event

When the report includes photographs, clearly describe what each image represents and what direction the view is facing. If using a digital camera, ensure the images are downloaded to a computer hard

drive or other memory device before deleting them from the camera. In the diagram space, orient the diagram/map so north is facing the top of the page.

## Analysis

This section looks at the specific actions, and underlying conditions that contributed to the incident, that were present or in effect at the time of the incident. This analysis should include looking at the task being done, materials and equipment used and other factors affecting the incident.

The six workplace hazard categories need to be explored to ensure all possible causes (the root causes) of the incident have been included. Each category has several elements to it and each may bear on the incident and must be examined.

Ergonomic design - repetitive work, work layout and environment, force/contact stress, posture/body position, work location layout and design, equipment design;

Safety/Mechanical - machine guards, interlocks & emergency stop devices, lock-out, pinch points, housekeeping, conditions of work floors and surfaces, trip hazards, moving equipment parts;

Physical - electricity, lighting/visibility, vibration, noise, temperature/humidity, ventilation, weather conditions (i.e. energy sources);

Chemical/Mineral - dusts, liquids, fumes, mists, solids, gases, vapours;

Communicable/Biological - moulds, viruses, bacteria, air quality, blood-borne diseases, sharps/needlesticks;

Work organization/Stressors - work process and procedures, health & safety standards and enforcement of these rules, pace/speed/intensity/pressure to produce, employee's emotional/physical status at time of incident, work load/demands, hours of work, labour/management issues, interaction with others in workplace, adequacy of supervision, maintenance provisions, hazard recognition and prevention, training/instruction/preparation of employee to do the job/task.

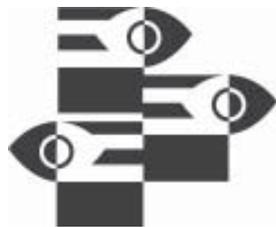
To get to the root cause of an incident, ask "WHY" five times. For example - an injury was caused by using a particular type of knife. Why was the worker injured? The knife slipped out of the employee's grasp. Why did the knife slip out of the grasp? etc.

## Prevention

Develop corrective action(s) that will prevent another incident. Some prevention strategies may include immediate or interim actions before long-term solutions can be put in place. Whether short-term or long-

term, the prevention action must be identified along with a target implementation date and a person assigned to ensure it takes place. (See the Prevention triangle for different types of prevention measures.)





## Mapping tools to see the workplace with “new eyes”

There are two main types of mapping tools for workplace safety and health - body maps and workplace maps.

Academics and doctors originally used body maps to investigate pain and musculoskeletal injuries (MSIs). Now many organizations and workplaces use them to look at symptoms. The injuries, illnesses and diseases for which they have been used range from MSIs to cancer to chronic pain.

Some body maps are drawn on the spot. Others are prepared and used to present information. In one workplace, information about workers compensation claims for people working around a printing press was put onto a map. The result: the map-makers “saw” head injuries they had not noticed on the list of statistics, and traced them back to a bar on which people were bumping their heads.

Workplace maps can be used to “see” symptoms, hazards and social information (e.g. how information gets around a workplace). The symptoms and hazards can be specific or general ones, depending on the questions and information you have.

Maps are becoming an essential tool for people dealing with health and safety issues.

**Why map?** Once something is visible, it’s hard to ignore the issue or situation. People talk about “seeing the workplace with new eyes” when they make body and workplace maps. The maps can be used to tell stories, identify “players” and start the process of prioritizing issues. Once identified, solutions can be developed and strategies to work towards them discussed.

For more information about mapping, see *Barefoot Research* in the Resource Guide and [www.hazards.org/ http://www.hazards.org/diyresearch/index.htm](http://www.hazards.org/diyresearch/index.htm).

### Body maps

You can make body maps in several ways.

For individuals or surveys: Use the body map outline included on page 5 of this document.

For groups: Use a sheet of paper (preferably a large one, like a flip chart) and draw a large version of the body map from this section. Label the front and back, and left and right sides.

To use the maps, also see Parts C and D of the Manual.

For more information about body maps, see the *Resource Guide* in this manual. For an example of how they were used during an investigation, see <http://www.cdc.gov/niosh/hhe/reports/pdfs/1998-0085-2715.pdf>.



## Workplace maps

Workplace maps are fun to make, easy to use and accessible to many. They can be made at meetings, before and after inspections or investigations, or by small committees analyzing particular problems.

These maps start with drawing the physical layout of the workplace or part of it. You then add information about who works there and safety and health issues.

These instructions are separated into basic and more advanced. Start with the version that suits your situation. Adapt as you go.

Remember that the instructions are for a map for one work area. Make more maps to cover the workplace and jobs elsewhere. Put them together in the way that best helps you “see” the connections and what’s happening.

## Instructions for making a workplace map

### 1. Get your supplies:

#### a) Basics

- one sheet of paper per work area
- coloured pens/pencils/markers - black, red, blue, yellow, brown, purple, green
- list of hazards (see below)
- *Hazard categories for mapping sheet*
- adhesive green dots (for workers) and red dots (supervisors) [get at stationary store]

#### b) More advanced

- flip chart sheet(s)
- markers - black, red, blue, yellow, brown, purple, green
- list of hazards (see below)
- *Hazard categories for mapping sheet*, p.6
- adhesive green dots (for workers) and red dots (supervisors) [get at stationary store]
- coloured string - three colours, including purple
- tape and scissors

### 2. Choose what work area you want to map. Make sure it is suitable for the size of paper. You want to be able to “see” hazards and where people are.

### 3. List the hazards. Beside each hazard category listed below, name one example found in the work area. You can add to this later. Use the *Hazards - the problems behind our symptoms* (SH. 2) sheet as a reminder about what each category includes.

*Physical* (from energy sources):

---

*Chemical/Mineral:*

---

*Communicable/Biological:*

---

*Ergonomic design:*

---

*Safety/Mechanical:*

---

*Work organization/Stressors:*

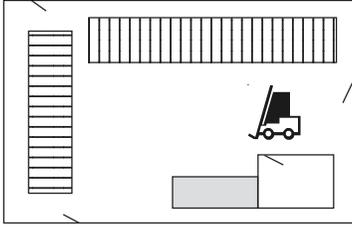
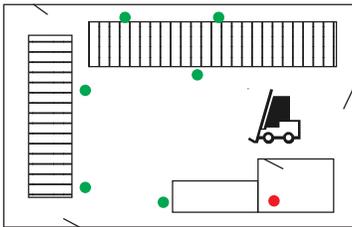
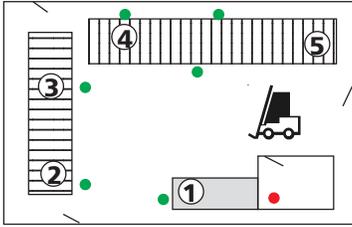
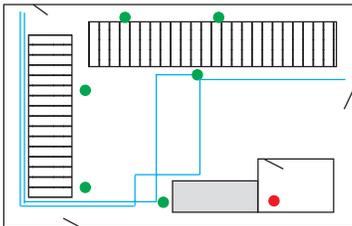
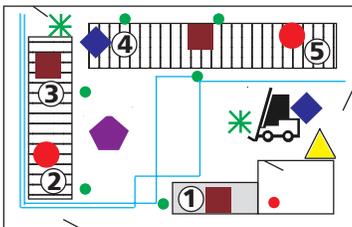
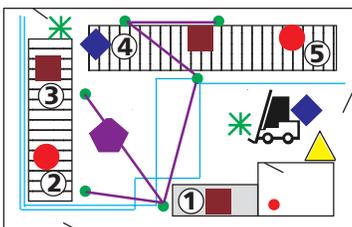
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**Mapping tools to see the workplace with “new eyes”**

4. Make the map using the chart below. The physical layout should include all rooms, important doors, windows and stairs,

equipment/machinery, desks and computers, etc. Add things as you go along, if you miss anything.

Information	Basic map		More advanced map
Physical layout	Draw the layout on the paper, using a black marker or pen. Choose a scale that fits the page.		Draw the layout on the paper, using a black marker or pen. Scale the drawing so it fits the page.
People	Put the <u>green</u> dots where workers usually are. Use <u>red</u> ones for supervisors.		Put the <u>green</u> dots where workers usually are. Use <u>red</u> ones for supervisors.
Production process or flow of work	Mark the order of things the production process. Use numbers or draw a line to show where it goes from start to finish. If it is not a production line, see next row.		Use coloured string to show the order in which things are done, from start to finish. If it is not a production line, see next row.
Where people go (places without production lines)	Choose a “typical” worker. Use a coloured marker or pen to draw their path in the workplace - where they go from arriving to leaving.		Choose a “typical” worker. Use coloured string to show their path in the workplace - where they go from arriving to leaving. Use clear tape to hold it down.
Hazards	Use the <i>Hazard categories for mapping sheet</i> . Put hazards from your list on the map, use the colours and symbols on the sheet. Make the icons large if the hazard affects a lot of people or the levels are high.		Use the <i>Hazard categories for mapping sheet</i> . Put the hazards from your list on the map, using the colours and symbols for each type. Make the icons large if the hazard affects a lot of people or the levels are high.
Lines of communication			Use the purple string to mark how the grapevine gets information around this work area. Use another colour of string to show how health and safety information gets around here. Tape the strings down.



## Mapping tools to see the workplace with “new eyes”

5. Analyze the map. Looking at the map you made, discuss it with questions such as:
- *What do you see? What’s going on?*
  - *Where is there more than one hazard?*
  - *What is one thing you learned from this map?*
  - *What’s missing?*
  - *What other information do we need?*
  - *How can we get it?*

Keep track of your answers to the last two questions. Decide how you will get the answers, assign individuals to do that and agree on a deadline.

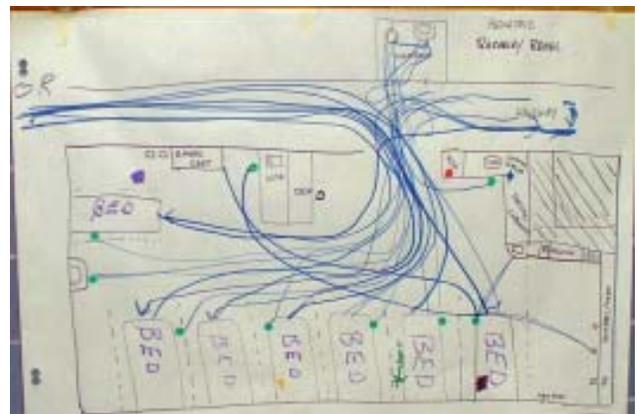
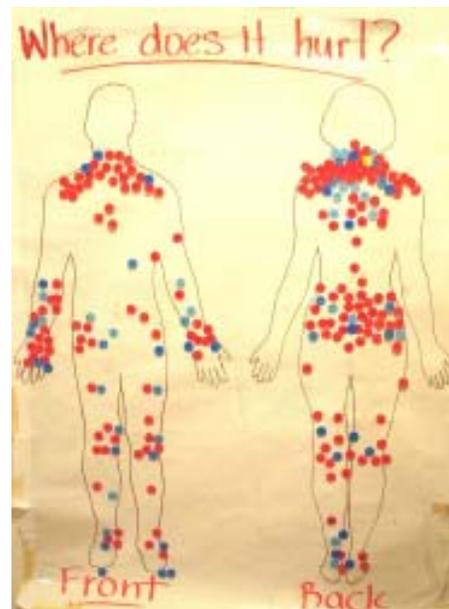
Put smaller maps together to get a picture about what’s happening in the whole workplace. The same questions are a good place to start to analyze the bigger picture.

6. Set priorities about which hazards need to be fixed. Start by discussing:
- *What are two priority hazards or situations in this work area?*
  - *Why are they important?*

For a more detailed, and organized, approach to setting priorities, use the tool called *Criteria for decision-making (CP.6)* in the Committee Process toolbox.

7. Follow-up by talking about how to use these maps. Examples include to:
- show where you expect to find hazards
  - keep track of where hazards are found during inspections and investigations
  - indicate where symptoms turn up
  - view the workplace from above, making it easier to “see” and analyse situations
  - set priorities
  - present information
  - plan changes

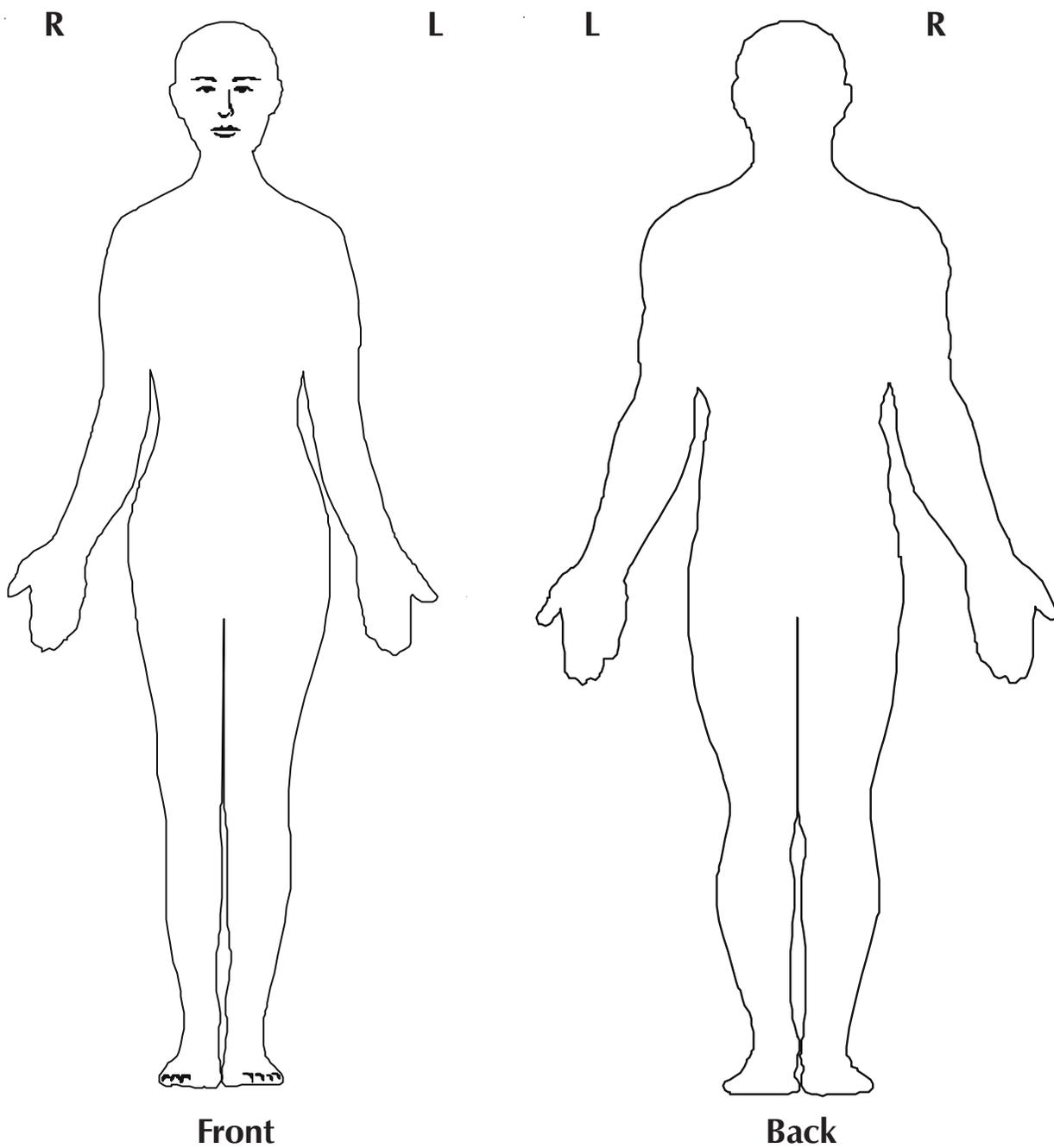
In your committee, make your own list of how you can use these maps.



Examples of workplace maps: left - a laundry area, bottom right - a hospital recovery room, and upper right - a body map.



# Where does it hurt?



## Hazard categories for mapping

Hazard	Colour	Icon
<b>Physical (energy sources):</b> lighting, electricity, vibration, noise, temperature, humidity, radiation	Red	
<b>Chemical/Mineral:</b> gases, mists, vapours, solids, dusts, fumes, liquids	Blue	
<b>Communicable/Biological:</b> blood-borne diseases, viruses, bacteria, moulds, sharps/needlesticks	Yellow	
<b>Ergonomic design:</b> repetition, awkward and static posture, force (including contact stress), work environment	Brown	
<b>Safety/Mechanical:</b> slips/falls, housekeeping, tripping hazards, moving equipment/parts, things that cause traumatic injuries	Green	
<b>Work organization/Stressors:</b> pace/intensity, social support/relations, workload/demands, control/latitude, flexibility for non-work responsibilities, violence	Purple	



# Prevention triangle

*Principles for solving health and safety problems\**



\* If you rely on level 3 prevention, the triangle is upside down and falls over.



## What's behind the prevention triangle?

The triangle borrows two concepts from the environmental movement.

**Substitution** is the principle about getting rid of toxic substances whenever a healthier and/or safer substance is available especially a non-toxic one. Substitution also describes changes about how things are done, using a different technology or reorganizing the task to reduce or remove hazards.

The **precautionary principle** - "better safe than sorry" - is part of Canada's federal environment law. The idea is that there must be proof that something is not harmful before it is used, rather than using workers or the community as guinea pigs and only taking action when problems appear.

The word "controls" is often used to describe changes or solutions that reduce exposure but don't remove the hazard. The current focus is prevention as opposed to putting up with a hazard. The Belgians offer a very useful way to do this, with levels of prevention (see <http://www.meta.fgov.be>).

**Level 1 prevention** is best. It gets rid of a hazard or avoids introducing a new one (when you use the precautionary principle). This is where substitution using non-toxic alternatives is most effective. Public health practitioners would call this primary prevention.

**Level 2 prevention** (or engineering solutions or controls at the source) limits the hazard at its source (reducing its spread). The hazard is still there but ways to prevent harm include:

- ventilation enclosing the hazard, taking it all out of the workplace (without damage the environment);
- enclosures to reduce noise levels;
- isolating the hazard or the people who may be exposed to it; and
- wet methods (with dusts).

**Level 3 prevention** only limits or reduces harm by putting something between the worker and the hazard source.

Changes or "controls" along the path between the hazard and workers, include:

- local ventilation that does not enclose the hazard;
- general ventilation;
- mechanical guards/devices; and
- some administrative controls (e.g. breaks).

At the worker ("controls at the worker"), Level 3 prevention includes personal protective equipment/clothing (PPE) and:

- some administrative activities (e.g. rotating workers, because studies say it just spreads the hazard around and may even make it worse for some, especially if hazards to the back are involved);
- work procedures, training and supervision, emergency plans;
- housekeeping, repair and maintenance programs, and hygiene practices and facilities; and
- things to take care of yourself (especially when you're stressed).

These solutions are the least acceptable way to try to fix a problem, although there are times when they're needed.



# Workplace stressors have toxic effects

## What we feel right away is ...

Dry mouth, difficulty swallowing

Out of breath or short shallow breathing

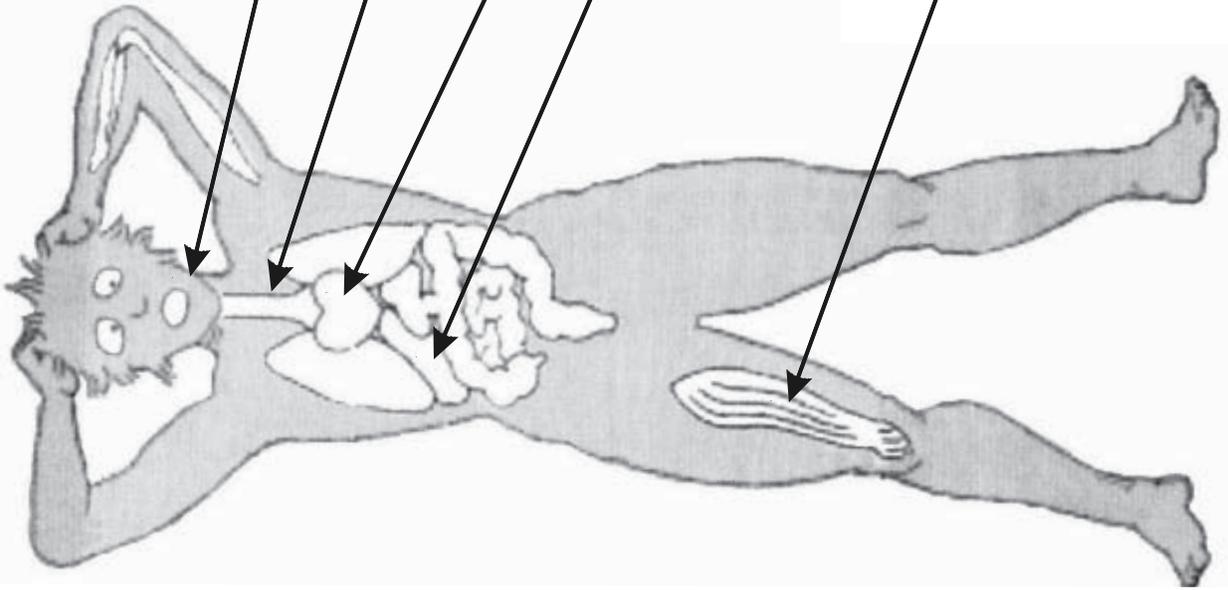
Heart races

Stomach feels “funny” (butterflies, knots)

Sweaty

Tense, achy, muscle pain, “shaky” feeling

Pins and needles



## What's going on? Short-term stress effects include...

Body fluids like saliva redirected into the bloodstream

Airways widen to bring in more oxygen/energy to muscles

Blood pressure and heart rate increase to send oxygen/energy to muscles

Liver releases stored energy

Skin sweats to cool hot working muscles

Bloodstream gets more cholesterol, fatty acids and sugar for extra energy

Protein production decreases, muscle tissue slowly breaks down

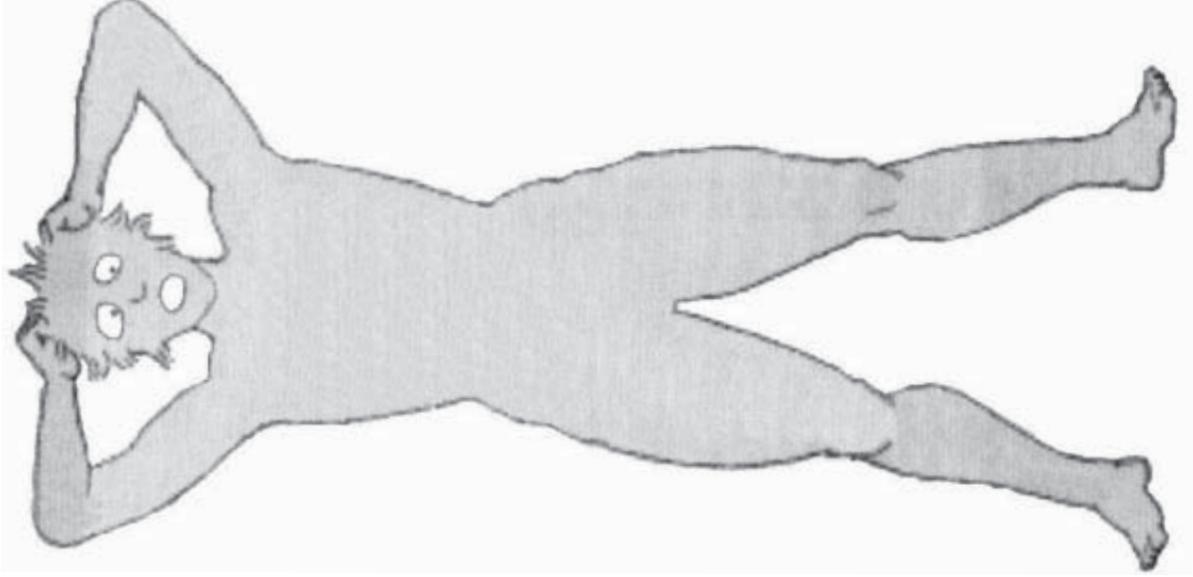
Muscles tense up

Calcium discharges from tense muscles



Adapted from *The anti-stress guide* by the Hospital Employees Union (2000).  
Available by going to [www.heo.org/AntiStress\\_Guide/](http://www.heo.org/AntiStress_Guide/)

## Strain/toxic stress - long-term effects of stressors



### Physical effects include ...

Sleep disorders, insomnia, fatigue, exhaustion

Headaches, tension, grinding teeth

Cardiovascular problems such as high blood pressure, heart attacks, other heart and circulation system problems

Chest pain/problems

Immune system problems which then make it easier to get sick

Asthma

Digestive system problems - spastic colon, ulcers, impaired digestion, irritable bowel syndrome, weight gain or loss

Diabetes

Menstrual disorders

Sexual dysfunction

Joint and muscle pains, arthritis

Burnout

### Non-physical effects include ...

Anxiety, increased tension and fearfulness

Feeling apathetic, low self-worth, blaming ourselves for our stressed state

Social isolation, withdrawal at home and work, stop participation in family, sports and community activities

Inability to concentrate and finish tasks

Mistrust, blaming others (company, co-workers, union, government)

Drug and alcohol dependency

Conflict with family and friends (sometimes violent), arguing with co-workers and supervisors

Anger, frustration, envy

Depression, mood changes, constant negativity

Suicidal thoughts

Over reaction, irrational behaviour

Job dissatisfaction

