



Healthy  
Workplaces  
**LIGHTEN THE LOAD**



## Body and hazard mapping in the prevention of musculoskeletal disorders

### Key points

- Body mapping is a technique that employers and workers' representatives can use to gather evidence from groups of workers about the effects of work on their bodies, such as musculoskeletal aches and pains.
- Workers use coloured pens or stickers to mark where they suffer aches and pains on an outline of the body. The collective results of this kind of mapping can:
  - identify clusters of problems that may need further investigation;
  - be used to encourage workers to discuss solutions to the problems they report.
- Hazard mapping is a similar method for collective information gathering. Workers use coloured pens or stickers to mark where hazards are on a map of a workplace.
- The results of mapping can be used as part of risk assessments and reviews, but are not a substitute for formal risk assessments.

All info sheets and other campaign materials are available to download from EU-OSHA's Healthy Workplaces Campaign website (<https://healthy-workplaces.eu>).

### Healthy Workplaces Lighten the Load

The European Agency for Safety and Health at Work (EU-OSHA) is running a Europe-wide campaign from 2020 to 2022 to raise awareness of work-related musculoskeletal disorders (MSDs) and the importance of preventing them. The objective is to encourage employers, workers and other stakeholders to work together to prevent MSDs and to promote good musculoskeletal health among EU workers.

## Importance of worker participation

Consultation with workers and their active participation are essential to ensure that risk assessments for MSDs are adequate and that the measures chosen to tackle them are effective. This is why employers have a legal duty to consult employees on safety and health issues. Workers know what aches and pains they are feeling and what aspects of their work may trigger them, and, because they know their job and have detailed knowledge of their work, they may have ideas for practical solutions to the problems encountered. It is also important that workers feel part of the solution and are involved in how it is implemented if ways of working are to be changed. When workers are not adequately involved, the chances of hitting upon the right solution and implementing it successfully are greatly reduced. Examples of good practices gathered by EU-OSHA provide clear evidence of the importance of worker participation (*Worker participation practices: a review of EU-OSHA case studies*, available at: <https://osha.europa.eu/en/publications/worker-participation-practices-review-eu-osha-case-studies/view>).

## Principles of worker participation

Worker participation is a simple two-way process between employers and their workers/worker representatives. Regardless of the size of an organisation, the principles are the same, although the format will differ and will depend on national legislation. These principles are:

- talking to one another – listening to what is said, learning from it and acting upon it;
- looking for and sharing views and information;
- discussing issues in good time;
- considering what everyone has to say;
- making decisions together;
- trusting and respecting each other.

## Mapping

One way of actively involving groups of workers in hazard spotting and risk assessment and in decisions about solutions is through the interactive methods of body mapping and hazard mapping. This kind of mapping is used to pool information on worker health problems by using visual images to highlight common problems for further investigation or action, as an alternative to using surveys for example. Body mapping and hazard mapping are particularly useful methods for providing information on MSD symptoms related to workplace risks, providing the basis for group discussion.

These interactive techniques are typically carried out at a meeting or workshop with a group of workers and allow them to discuss their workplace, how it affects their health and what improvements could be made. Mapping also allows workers to see if their problem is actually work related. A single individual may suffer from a particular ache, but if body mapping shows that this ache is common to everyone, it suggests that it is likely to be work related.

The results can then be fed into risk assessments and subsequent review processes.

**Body mapping** —a tool for getting workers together to discuss how their job is affecting their health. It has been largely used for identifying musculoskeletal problems and ergonomic hazards, but is equally effective for documenting other health problems such as stress.

**Hazard mapping** —a technique that helps to identify and prioritise any workplace hazards such as stress, or chemical, physical, work design or biological hazards.



# Body mapping

Safety hazards in the workplace are easily spotted during a workplace inspection, but it is much more difficult to find out how work might be harming workers' bodies. Body mapping is a way of addressing this and identifying common patterns of health problems among workers in a particular workplace or doing the same job.

A body map is a chart showing the front and back views of a body. In a collective exercise, workers use coloured pens or stickers to place dots on flipchart diagrams of the front and back of the body map to indicate where they feel aches and pains while working. The result is a map showing trends in workers' symptoms.

Common symptoms can then be identified by looking at the patterns that emerge. The more marks there are in the same place on the body map, meaning the more workers there are reporting the same symptoms, the more likely this indicates something work related, rather than an isolated, individual problem. The technique works best with groups of workers doing the same or similar jobs.

## Running a body mapping session

### Resources

- Front and back body outlines (poster size or smaller). (NB: A large body map can be made by drawing round a person lying on the floor.)
- EU-OSHA male and female outlines for download - see annex to this infosheet
- Coloured pens or stickers, using different colours to identify different symptoms. For example:
  - **Red** for aches and pains;
  - **Blue** for cuts and bruises;
  - **Green** for illnesses;
  - **Black** for stress symptoms;
  - **Yellow** for anything else.
- Flip charts, paper and pens for group work and feedback sessions during which participants discuss the completed body map.

### The activity

#### 1. Mapping the symptoms

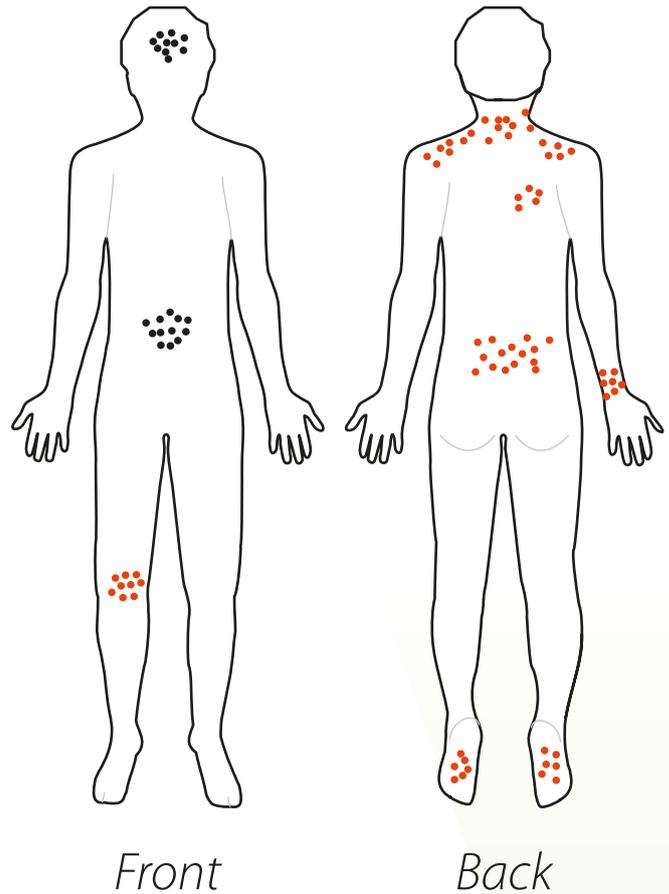
Ask workers to place stickers or coloured dots on the body map to show where it hurts.

As they apply the stickers, ask them to explain briefly why they have placed them where they have, and make a note of their answers.

Ask them to think about muscular aches and pains, as well as other hazards, such as stress symptoms (e.g. headaches) or feeling too hot or cold, as these can also have an effect on MSD risks.

The body map may help to indicate whether a particular symptom is a problem for just one worker or for everyone as clusters begin to appear.

- Aches and pains
- Stress symptoms



#### 2. Discussing the symptoms

Once everyone has finished putting the stickers or coloured dots on the body map, ask the group to look at it together and discuss what they can see. Possible questions to ask include the following.

- Can you see any clusters or common patterns of dots?
- Can you see any differences?
- Can you identify and explain what the clusters could be in relation to musculoskeletal ill health such as aches and pains or chronic illnesses? (Labels can be added to the map to indicate what the clusters could relate to.)

#### 3. Identifying the hazards — what do you think the causes could be?

Once the symptoms have been identified, discuss possible causes with the group. Possible questions to ask include the following.

- Can you identify the different types of hazards?
- Can you see any patterns or peculiarities in the hazards identified?

Make a note of their answers on a flip chart. This could be done by splitting into smaller groups and then having each group report back to the whole group.

The causes may not all be work related, but the more workers there are reporting the same symptoms, the more likely it is that the work or working environment is a factor.

#### 4. Identifying solutions and priorities for action — can you suggest any solutions?

Conclude the session by asking the group to discuss what solutions could be proposed and what priorities could be set. Again, this could be done in smaller groups and then each group could report back to the whole group.

## Hazard mapping

Hazard mapping is a similar type of collective activity used to gather information about hazards in a workplace. Workers use coloured pens or stickers to mark the hazards that are present on a drawing of their workplace. Hazard mapping helps workers to visualise their workplace and the hazards that exist.

## Running a hazard mapping session

### Resources

- Flip charts and paper.
- Coloured pens or stickers could be used in the following ways:
  - One option is to use colours to identify different hazards:
    - Red** for work design hazards (e.g. ergonomics);
    - Blue** for physical hazards (e.g. noise, heat);
    - Black** for psychosocial hazards (e.g. stress, shift work);
    - Green** for chemical hazards; and
    - Brown** for biological hazards.

– Another option is to focus more on MSDs:

**Orange** for manual handling hazards;

**Yellow** for repetitive work;

**Pink** for posture (e.g. awkward postures, static postures);

**Purple** for forceful movements;

**Red** for task and equipment design hazards (e.g. poor ergonomics); and

**Black** for work organisation and stress (e.g. pace/intensity, breaks, workload/demands, control over how work is carried out).

### The activity

Ask a group of workers who work in the same locations to draw their work area, including the equipment in the area, themselves and their colleagues. (NB: A floor plan of the work area may be available and could be used.) Ask them to mark hazards using coloured stickers or pens.

#### 1. Map the work area

Instruct participants to work as a group to:

- draw the physical layout of their work areas;
- include co-workers (these can be drawn as stick people);
- draw any hazards that exist;
- label the hazards, e.g. hot surfaces;
- colour code hazard categories.



## 2. Discuss the hazards

Once the map has been drawn, ask workers what observations they can make about it. Possible questions to ask include the following.

- Are there any patterns or common hazards?
- Is there anything surprising about what you see?
- Why are these different hazards occurring?
- Which hazards are the most important or serious?

Make a note of their answers on a flip chart.

This could be done by splitting into smaller groups and then having each group report back to the main group.

## 3. Identifying solutions and priorities for action — can you suggest any solutions?

Conclude the session by asking the group:

- What solutions could be proposed? This could be done using a table with four headings: 'Hazard', 'Cause', 'Effect' and 'What can be done?'.
- What priorities could be set (e.g. depending on which hazards are most serious, what steps could be taken in the short term and in the long term)?



## Input for risk assessment and monitoring processes

The results of mapping can be discussed among workers as well as by safety committees etc. If mapping results are used as an input for a risk assessment, the mapping can be repeated after prevention measures have been introduced to help determine their effectiveness. However, although mapping techniques can be used as an input to risk assessments, they are not a substitute for a formal risk assessment. It is very important that the results of the activities are acted upon, and that workers are provided with feedback, so that they know that their views and participation are valued and have been taken into account.

Moreover, by comparing the symptoms of workers working in the same area, or doing the same tasks, common themes can be identified. These can then be compared with those of different groups from the same workplace to see how problems differ between jobs. To help get a gender perspective, the techniques can be used with groups of women only or men only and the results compared.

Mapping exercises should include a concluding task where workers are involved in recording the most serious concerns and discussing recommendations – involving workers in prioritising and planning actions helps to develop plans that will work in practice.

## Trade unions and mapping

Mapping techniques have been used extensively by trade unions to help them discuss health and safety with their members and provide research findings they can use to negotiate with employers. In some cases, trade unions have carried out mapping exercises retrospectively (using workers' collective memory to draw a map of how a workplace was in the past) to gain an insight into possible links between work and chronic illnesses with a long latency period, such as cancer.

### Examples of mapping exercises carried out by trade unions with groups of workers

#### Cleaners from an evening shift

Clusters indicating aches and pains in the wrists and lower back had emerged. Following a discussion about common symptoms, it was noted that in the past electric floor buffer machines were either kept on each floor and in each hut, or were lifted up or down by two cleaners or a cleaner and a janitor. A change in practices meant that there were fewer machines, which led to them needing to be physically moved more often, including up and down stairs, sometimes by only one cleaner.

#### A group of teachers

A mapping exercise revealed that clusters had emerged indicating wrist pain, eyestrain and lower back pain. It was suggested that this was due to the increased use of computers and having to share computer workstations, which led to ergonomic problems. The changes introduced included the provision of guidance, wrist pads and adjustable chairs.

#### Janitors and catering staff

Mapping revealed that catering staff were suffering from similar symptoms of lower leg tiredness and aching, and janitors from tiredness, general aches and headaches. Tasks were reallocated in the canteen, so that all workers could have a break from tasks involving constant standing. A timetable to track jobs with the aim of distributing the load over a week was introduced for the janitors.

## Using mapping techniques in education and training

As body mapping is a good awareness-raising technique, it can work well in the classroom or with young workers who are unfamiliar with the way work can cause aches and pains.

The techniques are versatile and can be used in a variety of ways. Ideas for using body mapping and risk mapping in an educational setting include:

- asking pupils to mark on a map of the classroom what may cause aches and pains, e.g. chairs, bags;
- asking pupils to mark on a body map where they have aches and pains after a day at school.

Another method is to run an activity with students who have been on vocational training. Students work together to create 'risk maps' of the hazards they faced on the job on drawings that they make of workplaces. From the risk maps, they create lists of hazards. Next, the students prioritise the list, for example by deciding on the three most important hazards and justifying their choices. They then brainstorm to identify possible ways of eliminating the hazards identified. Students are then asked to present their risk map to the rest of the class. This technique encourages young people to talk to each other about safety and to generate collective solutions to the problems they find.

Or the technique could be used with young nursing home workers. The workers put 'ouch' stickers on each other to indicate aches and pains associated with different activities. After common problems, for example in the back or shoulder area, are highlighted and recognised in this way, discussions can then focus on questions such as 'what causes the aches and pains?' and 'how can we prevent them?'



The Napo website includes a simple lesson plan based on body mapping. 'Be body wise with Napo: back', for use with primary school children is available at: <https://www.napofilm.net/en/learning-with-napo/napo-for-teachers/be-body-wise-napo-back>

### Example of a hazard map



## Benefits and weaknesses of mapping techniques

There are various benefits from incorporating worker mapping exercises into risk assessment and monitoring processes.

For example, body mapping:

- provides data;
- draws on worker knowledge and experience;
- actively involves workers in an interactive way;
- involves workers in risk assessment and monitoring;
- raises awareness by helping workers to think about their workplace;
- helps distinguish work-related problems from non-work-related problems;
- can be used in education and training in schools and with vocational students, as well as in workplaces;
- is useful when there are problems of unknown origin;
- is particularly useful if reading skills or language is a problem; it is a versatile method that can be adapted to the needs of the particular worker group.

Some weaknesses to be aware of:

- Sufficient time is needed to conduct the exercise thoroughly and effectively.
- Body mapping can be seen as intrusive, or too personal, and may cause some workers embarrassment. Another method is to put up posters for a period of days before the activity, in a common rest area for example, and ask workers individually to leave their marks on the map. This way they can find a moment to do it in private.
- Workers need to have trust in the process and assurances that the results will only be used in a collective way for risk assessment, and not to monitor or assess the health of individual workers.

### Sources of advice and further information

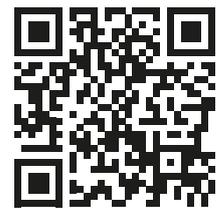
- Health and Safety Executive, 'Body mapping tool' (<http://www.hse.gov.uk/msd/pdfs/body-mapping-questionnaire.pdf>).
- Victorian Trades Hall Council, Occupational Health and Safety Training Unit, body mapping guidance (<http://www.ohsrep.org.au/tool-kit/ohs-reps-@-work-mapping-/part-1-body-mapping>).
- *Hazards Magazine*, DIY research resources interactive hazards detective tool (<http://www.hazards.org/diyresearch/>).
- Health and Safety Executive, 'Slips and trips mapping tool' (<https://www.hse.gov.uk/slips/mappingtool.pdf>).
- Health and Safety Authority, 'Mapping hazards to control slips, trips and falls' ([https://www.hsa.ie/eng/Topics/Slips\\_Trips\\_Falls/High-risk\\_Areas/Mapping\\_Hazards/](https://www.hsa.ie/eng/Topics/Slips_Trips_Falls/High-risk_Areas/Mapping_Hazards/)).
- Irish Congress of Trade Unions, *Using Workplace and Body Mapping Tools* ([https://www.ictu.ie/download/pdf/health\\_safety\\_risk\\_map.pdf](https://www.ictu.ie/download/pdf/health_safety_risk_map.pdf)).
- Trades Union Congress, Health and Safety and Organising – A guide for reps (<https://www.tuc.org.uk/sites/default/files/TUC%2025951%20Health%20and%20Safety%20Organising%20Report%20v4%20Lo-res.pdf>). This includes guidance for trade unions on mapping.
- International Labour Organisation, *Barefoot Research – A worker's manual for organising on work security* (<https://www.ilo.org/public/english/protection/ses/info/publ/2barefoot.htm>).
- Wigmorising website sections on body and workplace mapping (<https://www.wigmorising.ca/>).

## EU-OSHA resources

- *Worker participation in occupational safety and health — A practical guide* (<https://osha.europa.eu/en/publications/worker-participation-occupational-safety-and-health-practical-guide/view>). This guide provides general advice on worker participation.
- ‘Conversation starter 7: Using body mapping to collect early symptoms of MSDs’, in *Conversation starters for workplace discussions about musculoskeletal disorders* (<https://osha.europa.eu/en/tools-and-publications/publications/conversation-starters-workplace-discussions-about/view>). This is an exercise for discussing the use of body mapping.
- Napo training resource: ‘Know the early signs of MSDs’ (<https://www.napofilm.net/en/learning-with-napo/napo-in-the-workplace/know-early-signs-msds-0>). Part of the Napo ‘Understanding musculoskeletal disorders’ toolkit. This provides guidance on running a group activity on mapping in conjunction with the use of a short Napo film.
- OSHwiki ‘Body mapping for MSDs – using individual body maps’ ([https://oshwiki.eu/wiki/Body\\_mapping\\_for\\_MSDs\\_-\\_using\\_individual\\_body\\_maps](https://oshwiki.eu/wiki/Body_mapping_for_MSDs_-_using_individual_body_maps)).
- OSHwiki, ‘Hazard mapping and MSDs’ ([https://oshwiki.eu/wiki/Hazard\\_mapping\\_and\\_MSDs](https://oshwiki.eu/wiki/Hazard_mapping_and_MSDs)).

### Sources of body map outlines

- EU-OSHA male and female outlines for download - see annex to this infosheet
- Body outline templates: <https://osha.europa.eu/en/tools-and-publications/publications/healthy-workers-thriving-companies-practical-guide-wellbeing/view> (Annex 2).
- Clipart Library free body outlines: <http://clipart-library.com/person-outline.html>
- Unite the Union, *Negotiators’ Guide – Women’s health, safety and well-being at work* (<https://unitetheunion.org/media/1480/womens-health-safety-well-being-at-work-unite-guide.pdf>). Includes body maps for checkout staff and drivers.



[www.healthy-workplaces.eu](http://www.healthy-workplaces.eu)