

Prolonged constrained standing postures

Health effects and good practice

Executive Summary



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EXECUTIVE SUMMARY

Introduction

This report explores the issue of prolonged static or constrained standing at work (as opposed to work that involves walking around). Constrained standing is a significant problem for some groups of workers, and the health effects of prolonged standing include musculoskeletal disorders (MSDs) and non-MSDs, although the main focus of this report is on MSDs associated with prolonged constrained standing. The report examines the extent of prolonged standing at work, the health effects, guidance on ‘safe limits’ for continuous standing, and prevention practice to avoid prolonged constrained standing, reduce the risks when it cannot be avoided and promote a more dynamic workstyle. It also includes conclusions and pointers for policy-makers. The report aims to take into account the needs of micro and small enterprises (MSEs), and looks at various work sectors and gender and age- issues.

A second report, linked to this one, covering prolonged sitting ⁽¹⁾ and three OSHwiki articles ⁽²⁾ ⁽³⁾ ⁽⁴⁾ provide further information on prolonged sitting, prolonged standing and promoting moving at work.

Policy background

Although there is no specific occupational safety and health (OSH) policy on standing work in the European Union (EU), the general challenge of work-related MSDs has been recognised and prioritised in the EU’s OSH strategy ⁽⁵⁾. There are a number of EU directives on OSH, implemented by EU Member States, that are relevant to preventing risks from prolonged constrained standing.

What is prolonged constrained standing?

Working in a static or constrained standing position can be a problem when it is not possible to alternate standing with other postures and when the duration, on a daily basis, is too long. Prolonged standing can be defined as standing continuously for more than 1 hour or standing for more than 4 hours a day. Prolonged constrained or static standing also involves standing on the spot (movement restricted to a 20-cm radius) and not being able to obtain temporary relief by walking or sitting.

How much do we actually stand at work?

According to Eurostat data from 2017, one in five workers in the EU (20 %) spent most of their working time standing up ⁽⁶⁾. In the 2010 European Working Conditions Survey (EWCS) ⁽⁷⁾, 69 % of workers reported standing or walking for at least 25 % of the time.

Workers at risk

▪ Types of work

Jobs in which prolonged standing is prevalent include kitchen staff and waiting staff, welders and cutters, retail salespeople, reception staff, electricians, pharmacists, school teachers and childcare workers, physiotherapists, bartenders, assembly line workers, machine operators, security staff, engineers, library assistants, hairdressers, laboratory technicians, nurses and care workers, and receptionists. Many workers who have to stand at work are in low-paid jobs. There is also evidence that temporary workers are more exposed to standing work ⁽⁸⁾. Low-paid and temporary workers often have

⁽¹⁾ EU-OSHA (European Agency for Safety and Health at Work), *Prolonged static sitting at work: Health effects and good practice*, 2020. Available at: <https://osha.europa.eu/en/themes/musculoskeletal-disorders/research-work-related-msds>

⁽²⁾ https://oshwiki.eu/wiki/Musculoskeletal_disorders_and_prolonged_static_sitting

⁽³⁾ https://oshwiki.eu/wiki/Musculoskeletal_disorders_and_prolonged_static_standing

⁽⁴⁾ https://oshwiki.eu/wiki/Promoting_moving_and_exercise_at_work_to_avoid_prolonged_standing_and_sitting

⁽⁵⁾ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — ‘Safer and healthier work for all — Modernisation of the EU Occupational Safety and Health Legislation and Policy’, COM(2017) 12 final, 10.1.2017, p. 9. Available at <https://ec.europa.eu/social/BlobServlet?docId=16874&langId=en>

⁽⁶⁾ <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190305-1>

⁽⁷⁾ Eurofound, ‘Fifth Working Conditions Survey: 2010’, 2010. Available at: <https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys/fifth-european-working-conditions-survey-2010>

⁽⁸⁾ EU-OSHA (European Agency for Safety and Health at Work), *Work-related musculoskeletal disorders in the EU — Facts and figures*, 2010. Available at: <https://osha.europa.eu/en/publications/osh-figures-work-related-musculoskeletal-disorders-eu-facts-and-figures/view>

little discretion over how they work and when they can take breaks to sit or move around. In some jobs, workers can be required to stand unnecessarily, for example having to attend to clients standing up purely because it is considered more professional or for aesthetic reasons.

▪ Gender

According to the EWCS for 2010, in the EU 72 % of men report standing for at least 25 % of working time, while the figure for women is 66 %⁽⁹⁾. Typical male jobs, such as those in construction or warehouses, while involving prolonged standing, often involve more walking around than more constrained standing, which is prevalent in typical female jobs (such as hairdressing, production line work, cashier work)⁽¹⁰⁾. Women are often concentrated in low-paid jobs characterised by less control over how they work and when they can take a break from standing work. In addition, standing workbenches designed for the average-sized male worker will not be ergonomically suitable for many women.

▪ Pregnant workers

Prolonged constrained standing has been associated with adverse pregnancy outcomes⁽¹¹⁾. Standing becomes increasingly tiring as pregnancy progresses and could increase the risk of varicose veins. Standing time per day must be limited for pregnant women.

▪ Age and workers with chronic musculoskeletal conditions

In the EU, 70 % of workers aged 55 years and over stand and walk on the job, which is comparable to workers aged 25-54 years, whereas almost 80 % of workers aged under 25 years stand and walk on the job⁽¹²⁾. Prolonged standing can become problematic for workers with chronic conditions such as arthritis. As the workforce ages, there will be more workers with such conditions. The prevalence of MSDs increases with age, which is related to the length of cumulative exposure to MSD hazards over the work-life course. To ensure the sustainability of work over the work-life course, prolonged static standing needs to be reduced for all age groups, and additional measures may be needed for older individuals with reduced work capacity⁽¹³⁾.

▪ Ethnic minority workers

Workers born abroad are more likely to work mostly in standing positions than native-born workers. They are also more likely to report working in painful and tiring positions⁽¹⁴⁾.

Health effects of prolonged static standing

Based on a short review of literature, the report presents the cause and health effects of prolonged static standing in a graphic model. Prolonged standing is associated with both MSD and non-MSD health effects, which include the following:

⁽⁹⁾ Eurofound, 'Fifth European Working Conditions Survey: 2010', 2010. Available at: <https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys/fifth-european-working-conditions-survey-2010>

⁽¹⁰⁾ EU-OSHA (European Agency for Safety and Health at Work), *New risks and trends in the safety and health of women at work*, 2013. Available at: <https://osha.europa.eu/en/publications/reports/new-risks-and-trends-in-the-safety-and-health-of-women-at-work>

⁽¹¹⁾ Waters, T.R. and Dick, R.B., 'Evidence of health risks associated with prolonged standing at work and intervention effectiveness', *Rehabilitation Nursing*, Vol. 40, No 3, 2015, pp. 148-165. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4591921/>

⁽¹²⁾ Eurofound, 'Sixth European Working Conditions Survey: 2015', 2015. Available at: <https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys/sixth-european-working-conditions-survey-2015>

⁽¹³⁾ EU-OSHA (European Agency for Safety and Health at Work), 'The ageing workforce: implications for occupational safety and health — A research review', 2016, Available at: <https://osha.europa.eu/en/publications/ageing-workforce-implications-occupational-safety-and-health-research-review-0/view>

⁽¹⁴⁾ EU-OSHA (European Agency for Safety and Health at Work), *Workforce diversity and MSDs: Review of facts, figures and case examples*, 2019. Figures 21 and 22 based on data from EU statistics on income and living conditions 2017 and EWCS 2015. Available at: <https://osha.europa.eu/en/themes//musculoskeletal-disorders/research-work-related-msds>

- pain and disorders of the legs, knees, ankles and feet ⁽¹⁵⁾ ⁽¹⁶⁾ ⁽¹⁷⁾;
- low back pain ⁽¹⁸⁾;
- high blood pressure/restricted blood flow;
- heart disease;
- varicose veins;
- fatigue;
- problems in pregnancy.

Exposure to whole-body vibration when standing for prolonged periods, for example standing on a surface that vibrates, increases the risks of low back problems and other MSDs, especially if postures are constrained, awkward or poor.

Research also suggests that occupations involving predominantly standing are associated with an even greater risk of heart disease than occupations involving predominantly sitting ⁽¹⁹⁾ ⁽²⁰⁾. This underlines the importance of not just substituting standing work for sitting work but instead ensuring a combination of sitting, standing and moving on the job.

Regulations and guidelines

▪ Regulations

In accordance with EU directives, all employers in the EU have general duties to carry out risk assessments and put in place preventive measures based on the assessments ⁽²¹⁾. In selecting the measures, they should avoid risks if possible and adapt work to the worker. The risk assessment must also take account of any workers particularly sensitive to the risk, for example workers who are already suffering from sciatica or knee problems, whereas the directive on equal treatment at work ⁽²²⁾ requires employers to provide reasonable accommodation for workers with a disability.

Any workers who habitually use display screen equipment as a significant part of their normal work are covered by regulations on display screen equipment ⁽²³⁾ and must be provided with a chair. Directives on work equipment ⁽²⁴⁾, machinery ⁽²⁵⁾, vibration ⁽²⁶⁾ and manual handling ⁽²⁷⁾ may all be relevant to avoiding and improving the health and ergonomics of standing work. The directive on workplace safety ⁽²⁸⁾ covers the provision of rest areas with seating that has a backrest. The directive covering construction sites ⁽²⁹⁾ also includes provisions on rest areas. Employers should also provide protective footwear, if needed, that is suitable and comfortable. The directive covering pregnant workers ⁽³⁰⁾ requires employers to assess risks and decide what measures should be taken. This includes risks from movements and postures and fatigue connected to a person's work.

⁽¹⁵⁾ EU-OSHA (European Agency for Safety and Health at Work), *Work-related musculoskeletal disorders: Prevalence, costs and demographics in the EU*, 2019. Available at: <https://osha.europa.eu/en/publications/msds-facts-and-figures-overview-prevalence-costs-and-demographics-msds-europe/view>

⁽¹⁶⁾ Halim, I. and Omar, A.R., 'A review on health effects associated with prolonged standing in the industrial workplaces', *IJRRAS*, Vol. 8, No 1, 2011. Available at: www.arpapress.com/Volumes/Vol8Issue1/IJRRAS_8_1_03.pdf

⁽¹⁷⁾ Waters, T. R. and Dick, R.B., 'Evidence of health risks associated with prolonged standing at work and intervention effectiveness', *Rehabilitation Nursing*, Vol. 40, No 3, 2014, pp. 148-165. Available at: <https://doi.org/10.1002/rmj.166>

⁽¹⁸⁾ Health Council of the Netherlands, 'Standing, kneeling and squatting work'. Available at:

<https://www.gezondheidsraad.nl/documenten/adviezen/2011/12/23/staand-geknield-en-gehurkt-werken>

⁽¹⁹⁾ Smith, P., Ma, H., Glazier, R.H., Gilbert-Ouimet, M. and Mustard, C., 'The relationship between occupational standing and sitting and incident heart disease over a 12-year period in Ontario, Canada', *American Journal of Epidemiology*, Vol. 87, No 1, 2018, pp. 27-33. Available at: <https://academic.oup.com/aje/article/187/1/27/4081581>

⁽²⁰⁾ IWH (Institute for Work and Health), 'Prolonged standing on the job more likely to lead to heart attack than prolonged sitting', 17 August 2017. Available at: <https://www.iwh.on.ca/media-room/news-releases/2017-aug-17>

⁽²¹⁾ <https://osha.europa.eu/en/legislation/directives/the-osh-framework-directive/1>

⁽²²⁾ <https://osha.europa.eu/en/legislation/directives/council-directive-2000-78-ec>

⁽²³⁾ <https://osha.europa.eu/en/legislation/directives/5>

⁽²⁴⁾ <https://osha.europa.eu/en/legislation/directives/3>

⁽²⁵⁾ <https://osha.europa.eu/en/legislation/directives/directive-2006-42-ec-of-the-european-parliament-and-of-the-council>

⁽²⁶⁾ <https://osha.europa.eu/en/legislation/directives/19>

⁽²⁷⁾ <https://osha.europa.eu/en/legislation/directives/6>

⁽²⁸⁾ <https://osha.europa.eu/en/legislation/directives/2>

⁽²⁹⁾ <https://osha.europa.eu/en/legislation/directives/15>

⁽³⁰⁾ <https://osha.europa.eu/en/legislation/directives/10>

▪ Guidelines for standing at work

Based on the guidelines reviewed in the report, the advice is to focus primarily on the following:

- Complaints due to prolonged constrained standing could occur when standing daily for 15 minutes or more.
- Prolonged constrained standing means being constrained to or near a specific spot (within 1 m² without stepping out of the area).
- Avoid prolonged constrained standing at work:
 - for more than 1 hour continuously; and/or
 - for a total of more than 4 hours a day.
- Alternate as much as possible between postures in the following proportions:
 - 30 % standing;
 - 60 % sitting;
 - 10 % walking/moving/cycling.

It is important to understand that the opposite of sitting is not standing — it is moving. So, although a sit-stand table to alternate between sitting and standing is often useful, it is not enough, as you are still alternating between two static postures. The Institute for Work and Health recommends that you ‘stand when you want to, sit when you need to and move when you can’ ⁽³¹⁾.

Prevention practice

The general goal is to avoid prolonged constrained standing if possible, achieve a balance between standing, sitting and moving, and make work more dynamic.

▪ Prevention strategy to avoid prolonged standing

As with all areas of risk management, actions to avoid prolonged standing should be implemented within a strategy that takes a systematic approach, uses risk assessment and follows a hierarchy of prevention measures. The prevention strategy should ensure good workplace ergonomics and worker participation, with specific measures to avoid prolonged standing and promote moving more and standing less at work (i.e. making work more dynamic). The report includes a graphic to help decide whether work should be carried out sitting or standing.

The prevention strategy should include the following:

- Provide a suitable **ergonomic workstation and environmental conditions**, including an appropriate chair, stool and workstation. Incorporating **adjustability** (of working height, seating, sit-stand workstations, etc.) is important for safe and comfortable working.
- **Organise work to limit standing**, balance the tasks to be performed, and provide possibilities for task rotation, breaks when needed, etc. Give workers sufficient control over how they work, for example give them opportunities to alter how they work and to take a break when needed. It may be useful to establish maximum standing times.
- **Introduce additional measures to reduce risks if standing cannot be avoided**, for example mats and cushioned insoles.
- Encourage consultation and **active worker involvement** — this is important for all aspects of the strategy.
- **Promote healthy behaviour**, for example through raising awareness of and providing training on prolonged standing and back-care programmes. This measure will be ineffective unless implemented together with the other abovementioned elements.
- **Implement organisational policies and practices** to make sure it happens in practice, for example measures for workers to report problems with standing work.

It is important to assess the full range of risks factors, including prolonged standing, poor ergonomic postures, repetitive movements, manual handling and exposure to whole-body vibration and address them together in a comprehensive way.

⁽³¹⁾ IWH (Institute for Work and Health), ‘Sitting or standing? Which is best?’, 2018. Available at: <https://www.iwh.on.ca/videos-and-presentations/sitting-or-standing-which-is-best>

Often workplace interventions are simple and low cost.

- **Workstation ergonomics**

Important elements of workstation ergonomics for standing work include the following:

- Design the workstation and organise work to allow workers to alternate sufficiently between standing, using a stool, sitting on a chair and/or walking.
- Design workstations according to the tasks to be performed, for example take into account working height, and to prevent workers from having to reach too far or too high.
- Ensure sufficient leg, knee and foot space.
- Design workstations to avoid awkward neck or trunk postures, for example when viewing screens, or using tools and objects.

- **Our next posture is the best posture**

A good motto is ‘sit when you need to, stand when you want to and move when you can’⁽³²⁾. When standing is necessary, standing on a fixed spot should be substituted by more active or dynamic standing. Even being able to move around and change your standing posture within 1 m² can make a difference. A microbreak to move around every 30 minutes is important.

The report includes a chart for helping to determine whether work should be carried out sitting, standing or using a stool.

- **Measures and examples of workplace practice**

The report includes a number of measures that can be considered if constrained static standing cannot be avoided. These include flooring that provides some elasticity; anti-fatigue mats; comfortable, supportive footwear with cushioned soles; a wheeled saddle stool; measures to prevent whole-body vibration; and examples of ways to vary posture when standing.

The report also contains practical examples and sectoral guidance. For example, in an intervention for airport security staff, the following measures were found to be most effective: using a standing support; fatigue mats; and task rotation — alternating every 15 minutes between welcoming passengers (standing on a mat or using a stool), screen work (seated), X-ray work (standing on a mat), checking bags (standing on a mat) and body searching (being mobile).

Conclusions for the workplace

Prolonged constrained standing is related to various serious health problems, including lower back pain, pain in the legs, foot and heel disorders, cardiovascular problems and fatigue. Although many jobs in Europe involve prolonged constrained standing, some entirely unnecessarily, much can be done to organise work to avoid and limit it, and improve ergonomics and working conditions if standing work is performed. The factors identified in this report include the following:

- The most commonly used definitions of prolonged standing are more than 1 hour of continuous standing and/or a total of more than 4 hours of standing in a day.
- Unnecessary constrained standing should be avoided.
- Our next posture is the best posture. A good motto is ‘sit when you need to, stand when you want to and move when you can’⁽³³⁾. When standing is necessary, standing on a fixed spot should be substituted by more active or dynamic standing. A minibreak to move around every 30 minutes is important.
- The general approach to avoiding prolonged constrained standing at work should be through a prevention strategy that avoids unnecessary constrained standing, ensures good workplace ergonomics to limit standing and improve standing work, promotes movement at work and ensures worker participation. Adjustability of workstations, options to work in a variety of ways and workers being able to take breaks from standing work when needed are important. Finally, if constrained standing cannot be avoided, there are measures to alleviate its negative

⁽³²⁾ IWH (Institute for Work and Health), ‘Sitting or standing? Which is best?’, 2018. Available at: <https://www.iwh.on.ca/videos-and-presentations/sitting-or-standing-which-is-best>

⁽³³⁾ IWH (Institute for Work and Health), ‘Sitting or standing? Which is best?’, 2018. Available at: <https://www.iwh.on.ca/videos-and-presentations/sitting-or-standing-which-is-best>

health effects, such as mats and cushioned insoles.

- As with all MSDs, early reporting of problems related to prolonged standing is important.

Pointers for policy-makers

▪ Prevention strategy and practice

- For the sustainability of work over the work-life course, prolonged static standing needs to be avoided if possible and reduced for all age groups.
- More dynamic ways of working and alternating between standing, sitting and walking need to be promoted.
- Many workplace interventions are simple and low cost; however, employers must be provided with information to understand the basics. Good practices need to be shared.
- Guidelines on workstations and active working are needed, preferably sector- and subsector-specific guidelines. This includes simple, sector-specific resources for MSEs.
- Age and gender issues should be included in prevention approaches. One size does not fit all, especially when it comes to the ergonomics of standing work. More attention needs to be given to prevention of risks in constrained static standing jobs in which women predominate.
- Standing is not the opposite of sitting — moving is. Standing should not be just substituted for sitting in interventions to limit prolonged sitting.

▪ Gaps in knowledge and research tools

- Improved data are needed on the extent of constrained standing work and MSDs linked to constrained standing work. Data need to distinguish between constrained standing and walking. Gender-disaggregated data are needed.
- More research is needed on the cause-effect relationship between exposure to prolonged standing and health problems.
- There is a need for research on the right mix of sitting, standing and walking, as well as more research on the effects of alternating postures and taking microbreaks. This needs to take account of the type of work and gender.
- With regard to pregnancy, more information is needed on the effects on the foetus, as well as on ergonomic and fatigue issues for the woman.
- Improved tools to assess prolonged constrained standing and static standing postures are needed.

Overall conclusions

Tackling prolonged standing at work is part of making work more sustainable. Work should provide good ergonomic working conditions, and work and workstations should be designed to avoid prolonged constrained standing if possible. If standing work is carried out, workers should be able to move around, stretch and vary their posture when standing and also to vary between standing, sitting and perching. They need to be able to take breaks to sit and move when needed. There are many simple and low-cost steps that MSEs can easily take to avoid and improve standing work.

Remember:

Our next posture is the best posture! Stand when you want to, sit when you need to and move when you can.

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