Work from home:
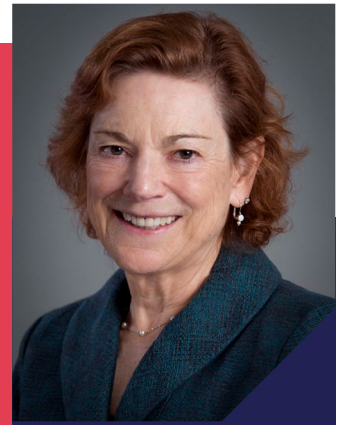## Human factors/ ergonomics considerations for teleworking

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Human Factors/Ergonomics (HF/E) is an essential element in the management of work during crisis situations such as the COVID-19 pandemic.

HF/E, the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, is also the profession that applies theory, principles, data, and methods to the design of work in order to optimize human well-being and overall system performance. Consideration of the science and profession of HF/E is critical to the design of sustainable work systems, which include humans interacting with tools and technologies in a physical and psychosocial organizational environment as well as an external environment, under specific organizational conditions. Each component of the work system impacts the other components.

The COVID-19 pandemic has caused an abrupt shift in the nature of work systems across the globe. Quarantines, restrictions on movement and gatherings, and 'shelter in place' directives have drastically increased the number of people who are working remotely from their homes or other non-traditional workspaces. This has many advantages in terms of curbing the spread of COVID-19 and can also benefit workers who need more flexibility to balance work and family responsibilities during the pandemic. However, the rapid change in work conditions is impacting many who are not prepared to adopt this new and unfamiliar work mode, and others who are not used to functioning with complete physical and social separation from the organization.

Moreover, the current move to teleworking is in many cases being accomplished without adequate consideration of HF/E requirements. Many new teleworkers are being asked to work from home with little support for setting up a workstation, ensuring a safe work environment, or protecting their physical and psychological health and wellbeing. This will likely have future effects in terms of work-related injuries and other health problems. Attention to HF/E issues from both a micro- (individual workers) and macro- (organization and environment) perspective is essential to support and protect workers, to ensure worker wellbeing and performance, and to achieve the benefits of telework. In this article, we provide a brief discussion of some basic HF/E issues in the design of tele-workstations as well as psycho-social and organizational issues and recommend HF/E strategies to address them.

▶ Characteristics of the Remote Workstation

The physical and environmental characteristics of the home workstation and home-work habits are critical to the workers' capability to perform remotely and effectively. The teleworker's workstation should be in a dedicated space that is private, quiet, and secure, preferably away from the flow of activity in the home. An area that is at least 2 metres x 2 metres is adequate to accommodate most work activities, equipment, and furniture requirements, including an ergonomically designed chair. Work surfaces should be approximately 66 cm high and at least 60 cm deep if a computer and printer are present. If a laptop computer or device are used, a full-size monitor, an external detachable keyboard, surge protectors, and a docking station should be provided. Cable and electrical management should be attended in order to minimize tripping and fall hazards, especially when extension cords and wirings cross the walking travel area. WiFi speed and capability should match the requirements of the work. Workers should have access to technical support and collaborative group software and communication tools available in the market. These real-time communication tools will allow workers to formally share information with their co-workers as well as support the informal conversations that are typically lost in remote work.

Some characteristics of telework, such as flexible work scheduling, can be of particular benefit to workers with disabilities. In keeping with the ILO Code of Practice on disability in the workplace, however, accommodations to the home workstation, to tools and equipment, and to job descriptions and requirements to enable effective performance should be planned in consultation with disabled workers and their representatives.

Establishing healthy telework habits such as taking breaks each hour, moving, stretching frequently and changing one's working posture throughout the day is important. Various wearable devices could be provided to provide reminders to workers to move, take steps, and change their work posture. Incorporating standing positions throughout the workday while computing along with changing one's sitting postures can mitigate musculoskeletal and visual symptoms (Chambers et al., 2019). Training on how to properly set-up and adjust one's workstation to obtain various comfortable computing postures and how to vary postures throughout the day is essential (Robertson & Maynard, 2016). ANSI-HFES 100 (HFES 2007) recommends four working postures to be incorporated throughout the day - upright sitting, reclined sitting, declined sitting, and standing. Useful guidelines on workstation design, lighting, and environmental issues can also be find in the section "Workstation design" of the ILO/IEA Ergonomics Checkpoints publication (2010).

If face-to-face training for teleworking is not possible, online training programs for work-at-home workers should be provided to help them set up an appropriate and safe workstation, identify and understand risk factors and human factors/ergonomic solutions, and recognize and report work-related health concerns and symptoms of harmful procedures or events. Clear processes for reporting accidents and job-related illnesses and injuries must be implemented, and at-home workers should be able to submit reports confidentially and without fear of reprisal.

▶ Psychosocial Issues and Communication

Although telework can provide extra opportunities for control and flexibility to care for children or other family members, it can also cause stress if workers are constantly forced to deal with simultaneous demands from work and family. Workers must have the ability to adjust work times around their home responsibilities and family needs. Establishing a routine of work and personal activities helps employees and household members to better balance their family and work time.

On the other hand, telework can produce a sense of social isolation, which can be detrimental to the psychological health and performance of workers. It is important to maintain the connection between at-home workers and

their managers and peers. Regular communication with managers and peers about current happenings, to share information and problem-solving ideas, and to discuss performance related issues is important. Also, online training on how to use the various internet communication tools, how to conduct a virtual meeting, and how to create an agenda to enhance virtual work group effectiveness, and on "Netiquette" (network politeness or etiquette conventions) in maintaining positive connections with co-workers will support work teams' tasks more efficiently. A common set of employer-provided communication and technology tools will help the home-based worker connect efficiently with co-workers.

▶ Organizational Considerations

The success of telework depends greatly on a sound relationship between workers and managers that is built on trust, respect, and mutual understanding. Employer organizations can do a lot to smooth the transition to work at home and ensure that teleworkers can be safe, healthy, and successful in this work arrangement by implementing HF/E practices such as:

▶ Parameters of telework arrangements and performance objectives and expectations should be clear and discussed on a regular basis.

▶ Online HF/E resources should be provided to help workers set up and evaluate their home-work environment. For example, company safety and health managers could provide tele-ergonomics workstation evaluations through video conferencing (however, managers will need to respect workers' home privacy).

▶ Providing support and training to workers regarding how to establish work/life balance and boundaries while working at home can help them gain a better sense of control and minimize interruptions, which in turn can positively impact work performance.

▶ Management may need to provide extra guidance for completing tasks when they are interdependent. Establishing clear individual and group recognition is also important.

▶ Structuring live group discussion using collaborative video conferencing will reduce the stress of working remotely and create a sense of belonging and group cohesiveness.

▶ Management should provide opportunities for workers to informally converse and share events among themselves and to recognize individual or team efforts using collaborative video conferencing. Virtual gatherings such as morning coffee or tea mimic what occurs in the office and can create positive interactions and allow workers to engage and connect informally.

▶ Access to training on mindfulness and other stress management techniques should be provided.

▶ Top management should provide clear direction for the maintenance of confidential company information and enable security measures for employees working from home, such as Virtual Private Networks (VPNs).

The role of employers and top management in supporting home-based teleworkers is essential given the current situation as they can provide the necessary tools and training and organizational direction to ensure their employees are working safely and comfortably. The HF/E practices above can address the physical and psychological health – as well as the effectiveness and success of teleworkers. More information and suggestions can be found in Robertson & Maynard (2016), and on the ILO website (https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_739879/lang--en/index.htm).

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