

16 ERGONOMICS, YESTERDAY, TODAY, AND TOMORROW

ANSWERS—QUIZ 1

1. a
2. b
3. a
4. b
5. b
6. c
7. d
8. b
9. d
10. a
11. b
12. MSD stands for work-related musculoskeletal disorder and involves conditions that affect the muscles, tendons, nerves, and supporting structures, such as the spinal discs.
13. These factors include wrist size or shape, pregnancy, oral contraceptives, gynecological surgery, acute trauma or injury, systemic diseases, and age.
14. The recommended method is to obtain data via periodic worker health surveys.
15. This rate is influenced by the physiological demands placed on a worker through the performance of a task and through the thermal environment (temperature and humidity).
16. The main issues to be considered are: the posture or position of the joints when the task is performed, the force exerted, and the repetition rate, or the amount of recovery time provided.
17. They are preferred because their primary focus is to design or redesign the job to accommodate the person, rather than making the person adjust to the conditions of the job.
18. It is recommended that a medical management program address the following issues: injury and illness record keeping; early recognition and reporting; systematic evaluation and referral; conservative treatment; conservative return to work; systematic monitoring; and adequate staffing and facilities.
19. The five goals of ergonomics are (1) to reduce the physical (and mental) stress associated with a given job; (2) to increase the comfort, health, and safety of a work environment; (3) to increase productiv-

ity; (4) to reduce human errors associated with a task; and (5) to improve the quality of work life. Ergonomics can also be described as making the most of the human/machine relationship to balance the capabilities of individual workers with the demands placed on them by the system.

20. A systematic evaluation can be done via direct observation or videotaping. The Keyserling method requires videotaping the job. Later the tape is analyzed in real-time to determine the percentage of time various body parts were in neutral and nonneutral postures. The Ovako Working Posture Analysis System (OWAS) is a direct observation method that evaluates the work performed by the worker.

ANSWERS—QUIZ 2

1. b
2. a
3. b
4. a
5. a
6. b
7. d
8. b
9. c
10. c
11. b
12. Human factors engineering is another name for ergonomics.
13. The demands placed on a worker fall into the following three categories: physical demands, environmental demands, and mental demands.
14. This is an example of a population stereotype.
15. The three questions are as follows: Is there any lifting activity? Is material pushed or pulled? Is the material carried from location to location?
16. It is useful to do this when illumination is low or when a control needs to be identified and operated through touch only.
17. The ADA may require the employer to alter the conditions under which the task may be done if the worker requests an accommodation for his disability.
18. These issues are more critical for maintenance workers.
19. Passive surveillance refers to information that is gathered from existing records to identify potential

patterns of disease within workplace. These records can be used to analyze trends in injury and illness rates in a particular department, job, workstation, or operation. Types of records that can be used for passive surveillance include OSHA Form No. 300 logs, workers' compensation records, plant medical reports, accident/incident reports, first report of injury, absentee records, and rate of turnover. These and other records should be reviewed periodically, but the frequency of review will depend on the degree of MSD problems in the workplace.

20. Management should consider whether the display intensity is higher than the lowest threshold level for sight or hearing because each sense has its own threshold level. It should question whether the sense is overloaded and the number of demands being made on sight and hearing at the same time. It should assess the display's compatibility with similar displays, controls, and machine movements and determine if any environmental factors could mask the display.

4. To be successful a program should be an inherent part of the company, take a combined proactive and reactive approach, and involve all affected personnel.

ANSWERS—CASE STUDY

1. After setting up case management, the next step is to address training and education. These issues are critical to the success of an ergonomics program. Training should fit the role of each employee affected by the program.
2. The fourth, and most important step, is the workplace improvement process. The basic approach to this process is similar to the traditional quality improvement cycle and includes the following steps: assessing the process (identifying potential problem jobs/tasks), planning the activities (evaluating and assessing to identify potential controls), doing (implementing controls/modifications in the job/process), and verifying the results (checking to make sure controls are effective).
3. In addition to WMSDs, an ergonomics program typically addresses visual task interfaces (including illumination levels), thermal stress (heat/cold), physical workload, duration of work, and vibration. These issues can be classified into categories: risk factors and workplace characteristics, physiological demands, physical demands, environmental demands, and design of displays, controls, and dials.