

Work-Related Musculoskeletal Disorders (WRMDs) in Sonography: The Ergonomics and Economics of Properly Designed Exam Room Equipment

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Conclusions:

Work-related musculoskeletal disorders (WRMSDs) can have far-reaching effects on both the individual employee and the ultrasound facility. Injured sonographers suffer physical, emotional, and financial distress as they attempt to obtain a diagnosis and treatment for their occupational injuries. They must deal with Worker's Compensation claims; loss of income; and, at the very worst, re-training into a different career. With the current shortage of sonographers nationwide, it is increasingly difficult to lose experienced sonographers to repetitive motion injury. Productivity within the ultrasound department suffers, as well as quality patient care.

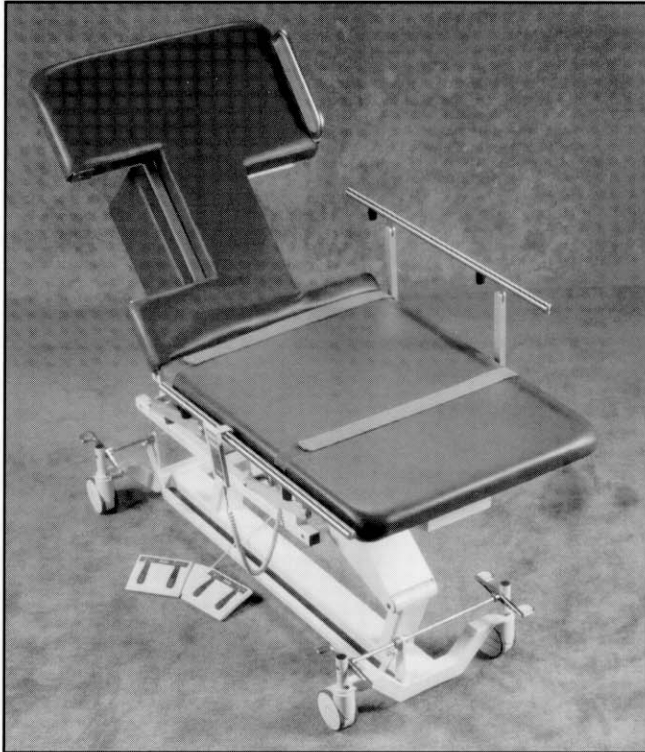
Prevention of these injuries is multifactorial and is dependent on the individual sonographer, the ultrasound department manager, and equipment manufacturers. As sonographers become more aware of what causes pain while they are scanning, they will encourage their department managers to consider ergonomics when purchasing exam room equipment. Ultrasound equipment is only one of the components of the exam room, and manufacturers are striving to produce equipment that has a more ergonomic design. However, this is only one component of the exam room. Ergonomic chairs or stools and exam tables are equally important in reducing occupational injury among sonographers. Properly designed ancillary equipment allows sonographers to attain comfortable postures while scanning and eliminates the need to overreach and to abduct the shoulder.

Chairs and stools used in exam rooms should be adjustable with good lumbar support. The seat pan of a chair should be the proper length for the individual. Chair and stools should have a foot rest and wheels so that the sonographer can easily move and turn the chair or stool if necessary during an exam.

Ergonomic exam tables play a key role in injury prevention. General exam table requirements included height adjustability from 22" to 40" and width between 24" and 27". Mattress thickness is recommended to be 2". Table weight capacity should be 400 pounds. A table should have retractable side rails that fold under the bed so nothing is level with the bed; there are no barriers between the sonographer and the patient to increase the examiner's reach. Side rails should be sturdy and run half the length of the exam table. Electric controls that can be foot-operated are recommended for height adjustments and table tilting. Exam tables used in hospitals should have holder for an IV pole and oxygen canisters. The table should be easily mobile with a braking system.

Special features, such as stirrups, may be required for exam tables used for obstetrical and gynecological ultrasound exams. The stirrups should be easy to remove or should retract.

Tables used for echocardiography exams should have removable or retractable cut-away sections that allow for more comfortable hand and wrist positions while providing access to the patient.



In those settings where a ARJO lifting device might be used, 4" of space from the floor to the undercarriage of the table would be necessary to accommodate the device.

When used properly, tables with ergonomic features allow the sonographer to raise or lower the table as needed to avoid having to reach above shoulder level. The patient can be positioned closer to the sonographer when the side rails retract under the table, thus preventing shoulder abduction.

The outcome of treatment for a work-related musculoskeletal disorder is poor. This is related to the fact that once the sonographer returns to work, the injury-producing hazards are often still present. Ergonomics, or fitting the job to the worker, strives to develop engineering controls for workplace hazards. These controls include equipment designed to eliminate hazards from the work place, and is the optimal method of reducing this exposure.

Equipment that reduces awkward postures can reduce the time it takes to complete an ultrasound exam, thus increasing productivity. The most recent survey by the Bureau of Labor Statistics, released in March of 2001 and reporting 1999 data, indicates that over 582,000 MSDs were reported that year resulting in more than one in three of total lost worktime cases. The cost of these injuries is significant. OSHA reports \$1 out of every \$3 of Worker's Compensation costs are currently spent on WRMSDs. Total MSDs expenses include both direct and indirect costs, which are those costs not covered by insurance. Direct costs include Worker's Compensation and medical care costs. Indirect costs, which are estimated to be up to 5 times more than direct costs, include re-training, lost time, decreased productivity, and replacing the injured worker. OSHA estimates the total MSDs expenses to be \$45-\$54 billion per year.

Providing and using properly designed ancillary exam room equipment will be a major step in reducing the sonographer's exposure to occupational injury and ensuring continued productivity and quality.

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