

# Important Questions to Ask When Purchasing a New Ultrasound System

*Author: Carolyn T. Coffin, MPH, RDMS, RVT, RDCS  
Sound Ergonomics, LLC*

Occupational musculoskeletal disorders continue to plague the sonography profession. The financial impact of these disorders on business and industry in many countries is significant. Addressing the risks for these disorders requires a multifaceted approach, and an important component is the equipment used in the work environment.

Ergonomic equipment design is an integral part of the ultrasound workplace and should be considered when purchasing ultrasound systems for your exam rooms. An important reason to consider ergonomics when making purchasing decisions is that dollars spent on improving the ergonomic design of the workstation have an excellent return on investment. This investment leads to reduced risk of musculoskeletal injury in sonographers, allowing the most experienced workers to remain in the work force. Many risk factors can be reduced or eliminated by informed equipment purchases. An ergonomic workplace increases the efficiency and productivity of an operator while reducing fatigue, exertion, and musculoskeletal disorders.

Ultrasound systems should have multiple adjustable features in order to accommodate the majority of users and all work styles. The goals: to eliminate static or awkward postures; improve access to the control panel while eliminating excessive reach; have displays that are easy to read, especially in low-light levels; and to have controls that are intuitive to operate and that do not require excessive force. An ergonomic workstation promotes effective interaction between the sonographers and the technology with which they interact.

Choosing the appropriate workstation equipment is not just the responsibility of management, but should include consideration of the needs of the sonographers using the equipment in the exam rooms. Considering that sonographers spend the majority of their workday interacting with the ultrasound system, it is important for them to have significant input into the features they would prefer to have on that

system. Purchasing the same type of system each time simply because it's what everyone is "used to", is not necessarily the best buying strategy.

To ensure that you have full knowledge of how the ultrasound system will fit into your department's work schedule, address all the exam needs of your department, provide diagnostic quality images and support comfortable sonographer work posture, you should be prepared to ask questions beyond those related to image acquisition and quality.

1. Is the entire ultrasound system easily height adjustable? This feature addresses the heights of the various sonographers who will be using the system. The average height in the United States for men is 5'9", and for women it's 5'4". However, there are workers who may exceed 6' tall and those who are less than 5' tall. In addition, some sonographers prefer to sit to scan. Many exams require the sonographers to change from sitting to standing, especially when scanning the patient's left side, in order to reduce excessive reach. Changing the height of the ultrasound system should be quick and intuitive.



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2. Is the height range adequate for the variety of exams performed in your lab? The range of height adjustability you will need depends on the types of exams you perform. The maximum height should be high enough so that workers over 6' tall can easily use the system without bending or reaching down. The minimum height range should be low enough so that workers who are less than 5' tall can position the control panel at approximately waist height when they are seated. This makes it easier for these sonographers to access the controls without reaching up. If your lab performs venous reflux studies, the minimum height should be even lower so that the sonographers can sit to scan the lower extremity without having to kneel on the floor and still be able to reach the control panel without reaching up.



3. Is the monitor mounted on a fully articulated arm? This is important for optimizing the sonographer's head & neck position. It should be easy to position the monitor so that the sonographer is looking straight ahead, regardless of how the control panel is positioned, and so that he or she is looking at the top of the monitor when his or her head is in a neutral position.



4. Does the monitor have a handle on the bottom? At first, you might not realize the value of this feature. A handle makes it very easy to reposition the monitor throughout exam using only one hand. Because this feature makes it easy to change the monitor position quickly, the sonographer is more likely to do it rather than use awkward neck positions to view the monitor throughout the exam.



5. Is the control panel fully articulated? A truly ergonomic control panel will move laterally from side to side, move horizontally toward and away and tilt. All those movements make it easier to position the control panel so that the sonographer's reach and arm abduction are minimized. This feature is invaluable when performing bedside exams since you can rarely get the entire ultrasound system close enough to the patient's bed. By moving the control panel laterally to one side, you can park the system wherever it will fit and then position the control panel so that the reach and abduction are reduced. Add this feature to the fully moveable monitor and you can achieve a comfortable work posture in the most challenging environments. Having the control panel tilt toward and/or away is also ideal since that can affect the sonographer's hand & wrist position.



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6. Are some controls accessible on the transducers? If you can freeze your images with one button push on the transducer, you can significantly reduce the reach to the control panel. This feature has the benefit of reducing exam time and, thus, reducing the amount of time the sonographer's scanning arm and hand could potentially be in awkward or static postures.

As with any "tools of the trade," an ultrasound system should not only help you produce high-quality, diagnostic images, but should have multiple adjustable features. You should learn to ask these important questions to ensure your ultrasound system is the best "fit" for you and your department.



About Sound Ergonomics, LLC: This company is a woman-owned consulting company specializing in the injury risks and ergonomics of allied health professions with a particular focus on diagnostic ultrasound. The consultants are not only multi-specialized sonographers with extensive backgrounds in clinical sonography and education, but are also certified in basic occupational ergonomics. Sound Ergonomics was founded in 2000 to address the growing issue of occupational injuries in the ultrasound profession. Through extensive research and publishing activities, Sound Ergonomics' consultants have added valuable information to the design and use of ultrasound and computer workstation equipment.