

Adult Cardiac Sonography

Occupational Risks and Safety Information for Students

Program: Cardiovascular Technology Program

Institution: Orange Coast College

Purpose

Adult Cardiac Sonography, also known as echocardiography, is a patient-care profession that requires students and sonographers to work directly with patients while operating specialized ultrasound equipment.

Like other health-care professions, cardiac sonography involves potential occupational risks. The purpose of this document is to inform students of these risks and to promote safe work practices throughout didactic, laboratory, and clinical education.

The program is committed to providing students with education and training designed to reduce preventable injury and promote the safety of students, patients, faculty, and clinical staff.

1. Musculoskeletal and Ergonomic Risks

Musculoskeletal injury is one of the most significant occupational concerns in cardiac sonography.

Echocardiographic examinations may require repetitive transducer movements, sustained pressure against the patient's chest, reaching, prolonged sitting or standing, and maintaining static or awkward body positions.

Potential areas affected include:

- Neck
- Shoulders
- Upper back
- Lower back
- Elbows
- Wrists
- Hands and fingers

Risk factors may include:

- Repetitive scanning motions

- Excessive transducer grip or pressure
- Reaching across the patient
- Elevated or abducted shoulders
- Wrist flexion or extension
- Bending or twisting the neck or trunk
- Prolonged static postures
- Inadequately adjusted examination tables or chairs
- Repetitive computer and keyboard use
- Insufficient recovery time between examinations

The Society of Diagnostic Medical Sonography identifies force, repetition, awkward or sustained postures, and contact pressure as important physical risk factors in sonography. OSHA similarly identifies prolonged postures, repetitive movements, patient handling, and equipment movement as ergonomic hazards for sonographers.

Students are expected to:

- Learn and consistently use proper scanning ergonomics.
- Adjust the examination table, chair, ultrasound system, and monitor before scanning.
- Maintain neutral body positioning whenever possible.
- Avoid excessive transducer pressure and gripping force.
- Position the patient appropriately and as close as practical to the sonographer.
- Avoid prolonged awkward postures.
- Use appropriate assistance when moving or positioning patients.
- Report persistent pain, numbness, tingling, weakness, or other symptoms to the appropriate faculty or clinical supervisor.
- Participate in ergonomic training provided by the program.

The American Society of Echocardiography's 2026 recommendations specifically emphasize ergonomic equipment, safe scanning techniques, environmental design, scheduling strategies, early recognition of symptoms, and education of cardiac sonography students.

2. Patient Handling and Physical Demands

Cardiac sonographers may be required to assist patients with:

- Moving onto or off an examination table
- Repositioning
- Turning or maintaining a position during an examination
- Transferring from a wheelchair or stretcher
- Positioning for imaging

Patients may have limited mobility, weakness, dizziness, pain, or other medical conditions.

Students should never attempt to move or lift a patient beyond their training or physical capabilities.

Students must follow facility policies and request assistance or appropriate equipment when needed.

3. Exposure to Infectious Diseases and Body Fluids

Clinical education requires direct patient contact. Students may encounter patients with known or unknown infectious conditions.

Potential exposure may occur through:

- Contact with blood or body fluids
- Contact with contaminated surfaces or equipment
- Respiratory droplets or airborne pathogens
- Contact with patients who have communicable diseases

Students are expected to:

- Follow standard precautions and applicable transmission-based precautions.
 - Perform appropriate hand hygiene.
 - Use personal protective equipment (PPE) as required.
 - Clean and disinfect transducers and equipment according to facility policy.
 - Follow clinical-site infection-control procedures.
 - Report potential exposures immediately according to institutional and clinical-site procedures.
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4. Exposure to Blood and Body Fluids

Although routine echocardiography is generally noninvasive, students may work in environments where blood or body-fluid exposure is possible.

Potential sources include:

- Intravenous access sites
- Wounds
- Surgical sites

- Blood or other body fluids
- Procedures performed in the clinical environment

Students must follow the clinical site's exposure-control procedures and use appropriate PPE.

Any occupational exposure should be reported immediately according to institutional and clinical-site policy.

5. Ultrasound Equipment and Electrical Safety

Students will operate diagnostic ultrasound equipment and associated electrical equipment.

Potential hazards may include:

- Damaged electrical cords or equipment
- Improper equipment use
- Wet environments around electrical equipment
- Improper cleaning or disinfection
- Equipment malfunction

Students must:

- Perform equipment checks as instructed.
- Report damaged or malfunctioning equipment.
- Keep electrical equipment away from inappropriate sources of moisture.
- Follow manufacturer and clinical-site safety procedures.
- Use equipment only as instructed and within the student's level of training.

6. Ultrasound Exposure and Patient Safety

Diagnostic ultrasound is a form of non-ionizing energy. Students must understand that ultrasound energy can produce biological effects under certain conditions.

Students will be taught to use ultrasound equipment according to the **ALARA (As Low As Reasonably Achievable)** principle.

Students should:

- Use the lowest output power that provides diagnostically useful information.
- Minimize exposure time when appropriate.
- Monitor displayed acoustic output information.
- Follow program, facility, and professional safety guidelines.
- Follow instructor and clinical-site direction regarding ultrasound exposure.

Patient safety is the priority during every examination.

7. Radiation Exposure in the Cardiac Clinical Environment

Routine diagnostic echocardiography does **not** use ionizing radiation.

However, cardiac sonographers may work in clinical environments where ionizing radiation is present, particularly in areas such as:

- Cardiac catheterization laboratories
- Electrophysiology laboratories
- Hybrid procedural environments
- Other areas where fluoroscopy or radiographic equipment is used

Students assigned to these environments must follow the clinical site's radiation-safety policies and instructions.

Students should:

- Follow all posted radiation-safety procedures.
- Remain in designated safe areas when radiation is being used.
- Wear required personal protective equipment.
- Follow instructions from qualified clinical personnel.
- Never enter a restricted area without authorization.

The American Society of Echocardiography identifies ionizing radiation exposure as an occupational consideration for cardiac sonographers working in interventional environments.

8. Patient-Related Safety Risks

Cardiac sonographers may examine patients who are medically unstable or have significant cardiovascular disease.

Potential situations may include:

- Chest pain
- Shortness of breath
- Dizziness or syncope
- Abnormal heart rhythms
- Hypotension
- Acute cardiovascular conditions
- Patients requiring oxygen or other medical support

Students must recognize that a patient may experience a change in clinical condition during an examination.

Students must:

- Follow clinical-site emergency procedures.
- Remain within their scope of training.
- Immediately notify the appropriate clinical personnel of concerning patient symptoms or changes in condition.
- Never independently diagnose or manage an acute medical emergency beyond their training.

9. Chemical and Cleaning-Product Exposure

Students may encounter disinfectants, cleaning agents, gels, and other chemicals used in the clinical environment.

Potential effects may include:

- Skin irritation
- Eye irritation
- Respiratory irritation
- Allergic or sensitivity reactions

Students must follow:

- Facility chemical-safety procedures
 - Manufacturer instructions
 - Required PPE procedures
 - Safety Data Sheet (SDS) information when applicable
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10. Environmental and Workplace Hazards

Clinical environments may present additional hazards, including:

- Slips, trips, and falls
- Cluttered work areas
- Equipment cables
- Transporting ultrasound equipment
- Limited workspace
- Noise
- Inadequate lighting
- Prolonged computer use
- Fatigue and prolonged standing or sitting

Students are responsible for maintaining awareness of their surroundings and following clinical-site safety procedures.

11. Psychological and Emotional Demands

Cardiac sonographers may encounter patients with serious, chronic, or life-threatening cardiovascular conditions.

Students may experience emotional stress when caring for:

- Seriously ill patients
- Patients receiving emergency care
- Patients with life-threatening conditions
- Patients receiving unexpected or difficult diagnoses
- Patients who deteriorate during an examination
- Patients who die during hospitalization

Students should seek appropriate support from faculty, clinical supervisors, or institutional resources when needed.

Maintaining professional boundaries and appropriate communication is an essential component of patient care.

12. Fatigue and Workload

Cardiac sonography may involve:

- Repetitive examinations
- Prolonged scanning
- Standing or sitting for extended periods
- Computer and documentation requirements
- Emergency or inpatient examinations
- Variable clinical schedules

Fatigue may affect concentration, physical performance, and patient care.

Students should practice appropriate self-care, recognize signs of fatigue, and communicate concerns through appropriate program or clinical channels.

13. Prevention of Occupational Injury

Occupational injury prevention begins during student education.

Students are expected to develop safe habits before entering professional practice.

Important prevention strategies include:

Position

- Maintain neutral posture.
- Keep the patient and equipment positioned appropriately.
- Minimize reaching and twisting.

Equipment

- Adjust the examination table and chair.
- Position the monitor appropriately.
- Use adjustable equipment whenever available.

Scanning

- Minimize unnecessary transducer pressure.
- Avoid excessive gripping.
- Alternate scanning techniques when appropriate.
- Use both hands appropriately when possible.

Movement

- Avoid unnecessary lifting.
- Use assistance for patient transfers.
- Use proper body mechanics when moving equipment.

Recovery

- Take appropriate microbreaks when permitted.
- Change position regularly.
- Perform appropriate stretching or movement activities as taught.
- Report symptoms early rather than continuing through significant pain.

14. Student Responsibility for Safety

Students are responsible for actively participating in their own safety.

Students must:

1. Follow program and clinical-site safety policies.
2. Follow faculty and clinical instructor directions.
3. Use appropriate PPE.
4. Apply proper ergonomic techniques.
5. Report unsafe conditions.
6. Report injuries or exposures promptly.
7. Ask for assistance when a task exceeds their training or physical capabilities.
8. Maintain patient confidentiality and professionalism.
9. Remain within the scope of student practice.
10. Participate in required safety education and training.

15. Important Reminder

Occupational risks cannot always be completely eliminated.

The purpose of identifying these risks is not to discourage students from entering the profession. Rather, awareness of occupational hazards allows students to develop safe professional behaviors and reduce preventable injury.

Ergonomics and injury prevention should begin during education and continue throughout a cardiac sonographer's career. The American Society of Echocardiography's 2026 recommendations specifically encourage educational programs to incorporate ergonomics and

work-related musculoskeletal-disorder prevention into didactic and scanning laboratory education.

Student Acknowledgment

I acknowledge that I have received and reviewed information regarding the potential occupational risks associated with education and employment in Adult Cardiac Sonography/Echocardiography.

I understand that potential risks may include, but are not limited to:

- Musculoskeletal and ergonomic injury
- Repetitive-motion injury
- Patient-handling injury
- Exposure to infectious diseases
- Exposure to blood and body fluids
- Exposure to cleaning chemicals
- Equipment and electrical hazards
- Ultrasound-related safety considerations
- Potential exposure to ionizing radiation in certain cardiac clinical environments
- Patient-related emergencies
- Environmental hazards
- Fatigue and emotional stress associated with patient care

I understand that the program will provide education regarding appropriate safety practices and that I am responsible for following program and clinical-site policies.

I understand that I should report injuries, symptoms, exposures, or unsafe conditions promptly to the appropriate faculty or clinical supervisor.

Student Name (print): _____

Student Signature: _____

Date: _____

Program Representative: _____

Signature: _____

Date: _____

Program Documentation

Related Accreditation Requirement:

JRC-CVT Standards and Guidelines, **V.A.2 — Publications and Disclosure**, requires specified information, including **occupational risks**, to be made known to applicants and students. The current JRC-CVT Standards were revised in 2024 and became effective August 1, 2025.

Related Safety Principle:

The JRC-CVT Standards also address safeguarding the health and safety of patients/clients, students, faculty, and other participants involved in educational activities.

Recommended supporting resources:

- American Society of Echocardiography — *Guidelines for the Prevention of Work-Related Musculoskeletal Disorders for Cardiac Sonographers* (2026).
- Society of Diagnostic Medical Sonography — *Work-Related Musculoskeletal Disorders and Sonography*.
- Occupational Safety and Health Administration — *Sonography eTool*.