



**Santa Clara  
University**

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# Ergonomic Program

**Santa Clara University  
500 El Camino Real  
Santa Clara, CA 95053**

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## Program Review Record

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<b>Name</b>	<b>Title</b>	<b>Department</b>
Jeff Charles	Director	Facilities
Molly McDonald	Assistant Vice President	Human Resources
Sam Florio	University Risk Manager	Risk Management and CPSJ Insurance Group
Matthew Duncan	Associate Dean	Student Life
Esther Pham	Director	Research Compliance and Integrity
Don Ackerland	Director	Planning
John Ottoboni	General Counsel	Office of General Counsel
<b>Revision Number: 3 - Updates to program to reflect current process - November 2014</b>		
Sean Collins	Director	EHS

## Program Approval

<i>Signature on file in the EHS Office</i>	<i>1/31/11</i>
<b>Signature</b>	<b>Date</b>
Joe Sugg Assistant Vice President University Operations, University Operations	

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# Ergonomic Program

## 1. Purpose

The purpose of this program is to minimize ergonomic hazards and repetitive motion injuries (RMIs) at Santa Clara University (SCU) in compliance with California Code of Regulations, Title 8, Section 5110. This program includes:

- Ergonomics training for employees
- Identifying, treating, and tracking work-related repetitive motion injuries
- Providing worksite evaluations of jobs that have caused repetitive motion injuries
- Modifying worksites that have caused repetitive motion injuries

## 2. Applicability

The Ergonomics Program described in this document is applicable to all Santa Clara University employees (staff, faculty and student employees).

## 3. Definitions

NOTE: The most pertinent definitions for all users are contained in Attachment 1. Review and use as necessary.

## 4. Program Roles and Responsibilities

The following are the SCU Roles and Responsibilities in regards to the Ergonomic Program:

Group	Responsibilities
Faculty, Staff and Student Employees	<ul style="list-style-type: none"><li>• Complete New Employee EHS Orientation (IIPP) Training and conduct ergonomic self-assessment as instructed</li><li>• Request an ergonomic assessment by EHS if campus work station or work process is uncomfortable.</li><li>• Report symptoms of work-related Repetitive Motion Injuries (RMI) to their supervisor and HR (<u>Attachment 3</u> describes various symptoms)</li></ul>
Supervisors	<ul style="list-style-type: none"><li>• Ensure their employees complete New Employee EHS Orientation (IIPP) Training</li><li>• Participate in ergonomic training and review ergonomic training materials with employees</li><li>• Complete supervisor's section of the Incident Report Form for employees who report RMI symptoms (<u>Attachment 4</u> describes various symptoms).</li><li>• Respond to the recommendations and corrective actions of an ergonomic assessment for an employee that reports to them</li></ul>

	within a reasonable timeframe, working with EHS and HR as needed.
Human Resources Department	<ul style="list-style-type: none"> <li>• Assist employees who may have work related RMI symptoms</li> <li>• Assist supervisors and EHS, as needed, in implementing ergonomic assessment recommendations and corrective actions</li> </ul>
EHS Director	<ul style="list-style-type: none"> <li>• Provide ergonomic training and materials</li> <li>• Arrange for ergonomic assessments when requested.</li> <li>• Work with supervisors and employees to implement ergonomic assessment corrective actions</li> <li>• Evaluate the effectiveness of the Ergonomic Program.</li> </ul>
Planning Director	<ul style="list-style-type: none"> <li>• Integrate ergonomics considerations into workspace planning, workstation design, and building modifications.</li> <li>• Design for optimal environmental factors such as temperature, noise, vibration, and lighting during facility planning.</li> </ul>

## 5. Design Recommendations

The initial design of the workplace is a first line of defense to eliminate or reduce ergonomic hazards. It is important to design out the problem whenever possible. [Attachment 4](#) contains recommendations for proper ergonomic design.

## 6. Procedure

1. SCU employees will receive training regarding SCU's ergonomic program during New Employee EHS (IIPP) Orientation.
2. SCU employees should conduct an initial self-assessment of his/her work area and at any time when there are changes to the work station using the self-assessment materials available on the EHS website.
3. If an SCU employee cannot arrange their workstation to meet the conditions specified in the ergonomic self-assessment, they should request an in-person ergonomic assessment as instructed on the EHS website. EHS will arrange for the in-person assessment.
4. If a SCU employee experiences RMI symptoms that may be related to their work or work station setup (see [Attachment 3](#) for descriptions of symptoms), then the employee should contact the Department of Human Resources (HR) and notify their supervisor.

## 7. Reporting

The EHS Director periodically reviews effectiveness of the Ergonomic Program and reports the results to the Vice President for University Operations and the Safety Committee.

## 8. Training and Awareness

Employees shall be provided training that includes an explanation of:

- (A) The SCU Ergonomic program;
- (B) The exposures that have been associated with RMIs;
- (C) The symptoms and consequences of injuries caused by repetitive motion;
- (D) The importance of reporting symptoms and injuries to their supervisor and the Department of Human Resources; and
- (E) Methods used to minimize RMIs (Attachment 5).

The training shall be part of initial employee orientation and each employee is provided with the Ergonomic Workstation Self Assessment. Ergonomic information is provided on the SCU EHS website. Employees who request an ergonomic assessment will receive additional training related to their specific work area by the ergonomics specialist.

## 9. Record Retention

Completed records will be maintained as follows:

Record	Location	Duration	Responsible Party
Training Records – Orientation	EHS Training Records	3 year	EHS Department
Ergonomic Assessment Reports and Implementation Records	EHS	3 years	EHS Department
Medical Records	HR Files	30 Years after termination of employment	HR

## 10. Key References and Resources

The following are referenced in this program:

- **SCU Injury and Illness Prevention Program**
- California Code of Regulations (CCR), Title 8, Section 5110, *Ergonomics*.
- Public Law 91-596, Section 5(a)(1), Occupational Safety and Health Act, *General Duty Clause*
- ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations, 2007

- ANSI/Z-365 RMI Standard, *American National Standard for Control of Cumulative Trauma Disorders*, June 1993.
- National Institute for Occupational Safety and Health, Publication No. 78-185, *Safety in Manual Materials Handling*.

## **Attachment 1 - Definitions**

**Administrative Controls-** are procedural risk-control measures that include, but are not limited to: redesign of work duties, adjustment of work space, use of rest periods/breaks, training, or altering work duties to interrupt activities that pose a risk to the employee.

**Engineering Controls-** are engineered risk control measures that include, but are not limited to: devices such as adjustable workstations, tables, chairs, equipment, and tools; and physical modifications to workstations, equipment, tools, production processes, or any other aspect of the work environment.

**Ergonomic-** is the study of human interaction with the tools workers use, the work process, and the environment workers function in. The goal is to fit the job to the person. Ergonomics recognizes the capabilities, differences, and limitations of individuals, and adjusts the tools or environment accordingly.

**Ergonomic Hazards-** refer to the workplace conditions that pose a bio-mechanical stress to the worker.

**Repetitive Motion-** means to perform the same motion continuously for hours.

**Repetitive Motion Injury (RMI)** - is not a diagnosis, but a group of health problems with similar characteristics. RMI are soft tissue disorders (e.g., muscles, tendons, joints, nerves) caused by wear and tear from repetitive motion. RMI usually occur in the upper body in the neck, shoulders, back, arms, wrists, and hands and can lead to serious and/or permanent injuries. RMI are also referred to as repetitive motion injuries; repetitive motion disorders, repetitive strain injuries, repetitive trauma disorders, and overuse injuries.

**RMI Risk-** is the presence of the following factors in work activity whereby a RMI is substantially likely to result: frequency (repetition), force, duration, posture, exposure to localized or whole-body vibration, and exposure of hands and feet to temperatures cold enough to cause discomfort.

**RMI Symptom-** any of the following, when persisting or recurring: pain from movement, from pressure, or from exposure to cold or vibration, except, when the pain is due to an acute injury; numbness or tingling in an arm, leg, or finger, especially fingertips at night; decreased range of joint motion; decreased grip strength; and swelling of a joint or part of an arm, leg, or finger.

**Trauma-** bodily injury from mechanical stress.



## Attachment 2 - SCU Computer Workstation Checklist

Use the checklist to properly set-up your workstation before you begin work. If you cannot adjust your workstation according to these guidelines, contact EHS for assistance at <a href="mailto:spcollins@scu.edu">spcollins@scu.edu</a> or x5078.	
	<b>Chair</b>
	Feet supported by the floor or footrest.
	Chair height adjusted such that hips are slightly higher than the knees.
	Able to sit back in the chair, making full contact with the backrest.
	Seat pan supporting upper leg without pressing against calves. Maintain space (2 finger width) between back of knees and front of the seat.
	Backrest angle adjusted to support upright posture; reclined less than 10 degrees.
	Backrest height adjusted to provide lumbar support for lower back.
	Chair height adjusted so that keyboard and mouse are slightly below sitting elbow height; elbows close to body.
	If using armrests, adjusted to below elbow height to minimize interference with the desk or keyboard tray. <i>Note: Armrests can be removed by Facilities if not necessary.</i>
	<b>Keyboard and Mouse</b>
	Input devices positioned slightly below sitting elbow height- use keyboard tray to properly adjust if desk is too high.
	Input devices are close to body to keep elbows close to sides.
	Mouse at same level and next to keyboard.
	Keyboard flat or tilted slightly away from you (not tilted up) to keep wrists neutral.
	Use mini keyboard (keyboard without numeric pad) if numbers keys are not being used. This allows closer mouse position.
	<b>Monitor</b>
	Top of application screen (e.g. the body of email) in line with eyebrows.
	Monitor distance adjusted so that you may comfortably read the screen while sitting against the backrest: (one arm length away) if you lean in or crane your neck forward, the monitor is too far away.
	Center of screen is in line with center of body.
	<b>Accessories</b>
	Document holder (if used) is between the monitor and the keyboard, or right next to and at the same level as the screen.
	Frequently used items (e.g., binders, calculator, stapler, hole punch) are within arm's reach and not overhead.
	Telephone headset is available for simultaneous computer and phone work if needed.

## Attachment 3 - RMI Symptoms

Adapted from <http://www.safetyinfo.com/guests/Ergonomics%20Management%20White%20Paper.htm>

**Carpal Tunnel Syndrome-** compression or pinching of the median nerve where it runs through the wrist. Symptoms include pain, numbness, or tingling in the first three fingers and the base of the thumb. An aching sensation and wrist pain (mostly at night) is also typical of many cases.

**De Quervain's Disease-** progressive constriction of the tendon sheath. It affects the tendons on the side of the wrist and at the base of the thumb. Symptoms include pain and difficulty in movement.

**Epicondylitis-** also known as tennis elbow, is an inflammation of the tendons inside the elbow. Symptoms include pain, swelling, and weakness of the elbow.

**Hand-Arm Vibration Syndrome-** results from vibration stress to the fingers and hands. Symptoms include paleness in the fingers, pain, numbness, and loss of finger dexterity.

**Rotator Cuff Tendinitis-** an inflammation of one or more of the four rotator cuff tendons in the shoulder. Symptoms include pain and limited movement of the shoulder.

**Tendonitis-** an inflammation of the tendon in the hand and wrist due to excessive use. Symptoms include pain, swelling, tenderness, and weakness in the hand, elbow, or shoulder.

**Tenosynovitis-** an inflammation of the tendon and sheath surrounding a tendon. Symptoms include pain, swelling, and tenderness in the hand or arm.

**Trigger Finger-** the tendon sheath of a finger is sufficiently swollen so that the tendon becomes locked in the sheath. This will cause a snapping and jerking movement when attempting to move the finger.

**White Finger-** also referred to as the vibration syndrome or Raynaud's Phenomenon, order occurs when blood vessels in the fingers are damaged, especially from using vibrating tools in cold weather. Symptoms include paleness in the fingers, tingling, and a sense that the finger is "on fire".

## **Attachment 4 - Ergonomic Design Requirements**

Adapted from <http://www.safetyinfo.com/guests/Ergonomics%20Management%20White%20Paper.htm>

### ***Computer Workstation***

The Computer Workstation should be designed to accommodate each user. Adjustability is the key. It allows each employee to adjust the computer furniture (e.g., chair, work surface, document holder, keyboard and/or keyboard tray, etc.) and reorganize the work area to fit individual needs and good posture.

- The posture employed should minimize muscle tension and body strain.
- Good body posture permits employees to relax while maintaining a neutral body position.

### ***Chairs (this applies to all seating: office, laboratory lab bench stools, etc.)***

- Specify chairs that have a stable base (five point star-type), mobile, swivels, and allow for operator movement.
- Specify chairs that provide proper lower back support. The back support should be easy to adjust backward, forward up and down.
- Specify chairs that have adjustable seat height. The chair should be able to raise or lower to a comfortable height such that the thighs are parallel to the floor and the knees are at a 90 degree angle and the feet should be flat on the floor or a footrest provided.
- If specifying arm rests, they must allow elbows to be maintained at a 90 degree angle only.

### ***Work Surfaces***

- Work surfaces must be adjustable to maintain proper posture (i.e., elbows at keyboard height with the forearms parallel to the floor). A split-level design table or a keyboard tray with an adjustable height is preferable.
- Keyboard and mouse or trackball and the upper level for the computer monitor should be able to adjust separately.
- Specify a table large enough to hold the keyboard, monitor, wrist rest, mouse or trackball, and a document holder or all necessary documents.

### ***Monitors***

- Specify a monitor that has adjustable contrast and brightness.
- Can be positioned to prevent glare on the screen.

### ***Keyboards***

- Specify a keyboard that is detached from the monitor and able to be positioned directly in front of the monitor.

### ***Wrist Rests and Pads***

- Specify a wrist rest for support to help maintain a neutral wrist.

- Specify a wrist rest for cushioning to protect the wrist from resting on a hard or sharp work surface. Note that wrist rests are designed to be used during pauses in typing.

### ***Document Holders***

- Specify document holders that have adjustable height, large enough to support the documents the operator uses, and able to be positioned beside and parallel to the monitor.

### ***Footrest***

- Specify a footrest when the operator cannot rest his or her feet comfortably on the floor.
- Specify footrests that have adjustable height, heel stops, and is large enough to allow for operator movement.

### ***Printers***

- Specify printers with a low noise level or enclose the printer in a noise proof box.
- Locate the paper supply where the operator can easily reach it.

### ***Lighting Glare***

- To minimize eye fatigue and eyestrain, computer workstations should be designed at right angles to windows and parallel to and between light fixtures.
- Design the location of computer equipment so that bright light sources are not in the visual field while viewing the display screen.
- Design the appropriate illumination level for computer tasks, which is approximately half the intensity of normal office lighting. Ambient illumination in the room should be approximately 50 foot-candles (200 lux).
- Specify shades, drapes, or blinds to shield light from windows.

## **Attachment 5 - Minimize Ergonomic Risk Factors**

Adapted from <http://www.safetyinfo.com/guests/Ergonomics%20Management%20White%20Paper.htm>

### ***Risk Factors:***

Several factors, usually in combination, contribute to the risk of developing a cumulative trauma disorder (RMI) due to the stress on muscles, tendons, joints, and nerves. The presence of these factors in a job, process, operation, or work environment may not necessarily cause a problem, but they do increase the risk of developing a RMI.

- Repetition- tasks that require high repetition rates require more muscle effort and have less recovery time, which can lead to fatigue and stress.
  - An example of repetitive tasks is typing.
- Excessive Force
  - Examples of tasks in which it is possible to use excessive force are stamping, stapling, grasping large file folders, binders or books, and hammering onto a hard surface.
- Awkward Posture or Position
  - Examples of awkward postures or positions are using the shoulder and bending the neck to hold the telephone to the ear, turning the head to the side to read, bending the back in a forward/stooped position, reaching over the shoulder, and bending the wrists. Employees should always strive to maintain neutral postures.
- Prolonged Activities- holding a position without movement for prolonged periods causes fatigue and requires a long recovery time.
  - Examples of prolonged activities are standing or sitting for hours at a time, computer operators grasping the mouse for long periods, holding elbows away from the body while typing, and grasping a hand tool for an extended period of time.
- Localized Pressure (Mechanical Stress)- too much pressure on muscles, tendons, and nerves can decrease blood flow circulation. Over time, constant localized pressure can cause an injury.
  - Examples are pressure on the median nerve in the wrist, which can cause carpal tunnel syndrome, and resting forearms and wrists on sharp or hard edges (e.g., work surface corners, hard arm rests).
- Vibration- working with vibrating tools or equipment for extended periods of time can potentially cause damage to the nerves in the arms, hands, and wrists.
- Temperature (Cold)- Working in cold temperatures may also contribute to developing RMIs. Cold temperature can result in a loss of sensory feedback, which reduces manual dexterity.

### ***Minimizing Risk Factors: Exercise Eye Exercise***

- Look away from the work to a distance point at least every 15 minutes.

### **Body Exercise**

- Stretch the neck, shoulders, back, legs, arms, and fingers at least twice a day.
- Stand up and walk around often to increase blood flow circulation.

### **Minimizing Risk Factors: Manual Material Handling**

To minimize the risk of developing a RMI in the back, employees should follow these guidelines:

- Keep the back or torso erect with the natural curve of the spine intact.
- Keep the load close to the body.
- Avoid bending forward or backward or twisting while lifting or carrying the load.
- Avoid lifting, pushing, or pulling a load that is too heavy. Always get assistance when needed. The maximum weight of the load that can be handled will vary for each employee.
- Lift and carry a heavy load with two hands instead of one.
- Do not lean forward, backward, or to either side without support.
- Use a chair that supports the weight of the upper body when sitting for long periods. Adequate lower back support should also be provided to retain the natural curve of the spine.
- Lift loads to about waist height.
- Store loads above knee height, but below shoulder height.
- Bend at the knees to lift objects, not the back.
- Stay in good physical condition.

### **Minimizing Risk Factors: Safe Standing**

Standing for extended periods of time places static load on the back muscles, which can contribute to a back injury. To minimize the risk of developing RMI in the back when standing, follow these guidelines:

- Keep the back or torso erect with the natural curve of the spine intact.
- Stand on a rubber anti-fatigue mat for cushioning, not on hard floor surfaces. Footrests or foot bars can also be used to change positions.
- Tilt the work surface instead of bending continuously.
- Adjust the work to the appropriate height whenever possible. Generally, work should be done at approximately elbow height. The optimum work height, for standing or sitting, is based on the elbow height.
- For light duty tasks, set the work height so that the hands are positioned slightly (approximately 2 inches or 5 cm) below the elbow.

- For tasks that require lifting or downward forces, the work height should be lower. Examples are manual material handling and heavy grinding.
- For tasks that have extensive vision requirements, the work height should be increased. Examples are precision grinding and using a microscope.
- The work height is not the same as the work surface height.
  - The work height is the height of the interface between the operator (generally his/her hands) and the work.
  - The work surface height is the height of the table or bench that the work is sitting on.
- Raising the work height to improve posture (i.e., to minimize stress to the neck / shoulders / back) applies whether an employee is standing or sitting. Also, a cushion or rest should be used to protect the elbow from the hard work surface.
- Locate objects within easy arm reach to minimize leaning forward and awkward reaching (e.g., reaching over your head or behind your back).
- Alternate between standing and sitting when possible. Use a sit-lean stand as an alternative to a chair stool.

### ***Minimizing Risk Factors: Use of Hand Tools***

Improper hand tool selection or improper use of tools can cause RMIs. Hand tools should fit the employee's hand; employees with small hands or who are left-handed may need tools designed specifically for these situations. Hand and wrist posture are important because they affect how much force the muscles must produce to hold objects. When selecting and purchasing hand tools, these guidelines should be followed:

- Select tools that allow the wrist to be held straight and that minimize twisting of the arm and wrist. Good working posture can be maintained when properly designed tools are used.
- Select tools that allow the operator to use a power grip, not a pinch grip. Minimal muscle force is required to hold objects in a power grip posture. The pinch grip requires excessive fingertip pressure, and can lead to a RMI.
- Avoid tools that put excessive pressure on any one spot of the hand (i.e., sides of fingers, palm of the hand).
- For power or pneumatic tools, select tools with vibration dampening built in whenever possible. Provide personal protective equipment such as gel-padded gloves to reduce exposure to vibration.

