

	Controlling Laboratory Ergonomic Risk Factors	Effective:	February 7, 2006
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1. Purpose:

- 1.1 The purpose of this Policy is to identify the many ergonomic risk factors present in the laboratory, including awkward posture, high repetition, excessive force, contact stresses, and vibration. By learning how to control laboratory ergonomic risk factors, you can improve employee comfort, productivity, and job satisfaction while lowering chances for occupational injuries.

Awkward postures take the body out of neutral positions and can result in increased stress to muscles, tendons, and nerves. For example, the neutral position for the wrist is when the wrist is straight. Working with the wrist in a forward bent position results in compression or crimping of tendons on the palm side of the wrist and tension of tendons on the back of the wrist. This awkward position restricts the normal ability of the tendons to glide during the work activity and may result in injury.

High Repetition can result in injury if the repetition exceeds the body's capacity. Typically, given time, employees accommodate to given levels of repetition. Problems arise when there are dramatic increases in repetition, so great that the body cannot accommodate. While it is important to reduce repetitions whenever possible, it is also important to listen to the body. Symptoms are a signal that you may be exceeding your limits.

Forces vary with equipment type, design, and state of repair. Recognize that when applying force to an object, forces are transferred through your body. For example when activating a pipetter, forces are transferred to your finger or thumb. Forces transferred to your body are affected by not only the amount of force, but also the distance through which a force is applied. Choosing equipment that requires less force to activate and requires a shorter activation distance can reduce forces transferred to your body. Ensuring that equipment is in good working order helps reduce the overall forces to the body. The amount of force your body can accept without injury varies with the individual. It is also dependent on the size of the joint and the size of ligaments and muscles surrounding the joint. In general, it is best to position yourself and/or use tools which help transfer forces to larger joints, e.g. using the larger shoulder instead of the smaller wrist.

Contact Stresses occur when a force is concentrated to a small area, also known as pressure. Contact stress occurs when resting your forearm against the sharp edge of a hood. In this case, highly concentrated forces can disrupt the ability of the tendons to move within the forearm and cause inflammation of the tendon. If resting on a sharp edge is necessary, pad the edge to distribute forces. When grasping hand-held equipment, contact stress occurs in the hand and this stress can affect structures of the hand. It is important to ensure hand-held equipment fits your hand well. Ensure that hand-held equipment does not result in pressure at the base of the palm of the hand since the pressure can affect the median nerve. If necessary, padding can be added to the

equipment or you can wear a padded glove to reduce pressure.

Vibrations can be transferred to the body when holding an object on some types of oscillating equipment. For example, vibration to the hand occurs when holding tubes by hand onto a vortex mixer. In this case, using a vortex mixer rack instead of holding the tubes by hand can eliminate vibration. In other cases where it is not possible to eliminate vibration, padding the hand can reduce the amount of vibration transferred to the body.

The following information lists ways to reduce ergonomic risk factors for several common laboratory activities: pipetting, handling test tubes, and microscope use.

2. Scope:

2.1 This procedure applies to all technicians employed by the Ross University School of Veterinary Medicine.

3. Procedure

3.1 Pipetting:

To Control Awkward Postures:

- Work with wrists in straight, neutral positions - may need to incline sample holder or solution flask.
- Reduce reaching by
 - Using short pipettes.
 - Using low profile waste receptacles for used tips.
 - Using low profile solution containers.
- Keeping items as close as possible.
- Working with elbows as close to sides as possible.
- Ensure proper lower back and thigh support from chair and that feet are supported.
- Ensure items are positioned to minimize twisting of the neck and torso.

To Control High Repetition:

- Automate pipetting tasks.
- Use multi-pipettors whenever practical.
- Share workload between right and left sides.
- Vary pipettor types having different activation motions, e.g. thumb-controlled vs. finger-controlled.
- Take adequate breaks from pipetting activity-even short several second “micro-breaks” help.
- Rotate pipetting among several employees.
- Evaluate work processes to spread pipetting throughout the day.
- Add personnel for peak periods.

To Control Excessive Force:

- Choose pipettors that require less finger or thumb motion to activate.
- Choose pipettors that require less force to activate.
- Use only the force necessary to activate.

To Control Contact Stresses:

- Choose pipettors that best fit your hand.
- Do not rest forearms on sharp work surface edges; pad edge or forearm if necessary.

3.2 Handling Test Tubes:

To Control Awkward Postures:

- If seated, ensure proper lower back and thigh support from chair and ensure feet are supported.
- If standing, ensure the work surface is at the proper height to reduce the need to reach upward or bend forward. Upside down containers can be used to create higher work surfaces.
- Arrange test tube racks to minimize reaching and twisting.
- Work with elbows close to sides.
- Maintain straight wrist positions. This may require inclining test tube racks.

To Control High Repetition:

- Automate processes when possible.
- Share workload between right and left sides.
- Take adequate breaks away from handling activity-even short several second "micro-breaks" help.
- Rotate handling among several employees.
- Evaluate work processes to reduce steps requiring manual handling.
- Add personnel for peak periods.
- To Control Excessive Forces Automate test tube opening when possible.
- Use pinch (thumb working with index finger) for precision activities that require minimal force.
- Use full handgrip for activities that require greater force.
- Use cap removers that change handling from pinch to full handgrip.
- Request that samples be received in test tubes that allow improved ergonomics.
- Explore other sample mediums (e.g., genetic testing is moving away from testing blood to testing hair).

To Control Contact Stresses:

- Use two hands to open test tube samples.
- Do not rest forearms on a sharp edge of the work surface; pad edge or forearm or create a forearm rest pad.

To Control Vibration:

- Use vortex mixer rack instead of holding tubes by hand on vortex mixer.

3.3 Microscope Use:

To Control Awkward Postures:

- Ensure proper lower back and thigh support from chair and that feet are supported. Ensure adequate thigh clearance under laboratory bench; often low-hanging false fronts need to be removed.
- Raise, incline, and move microscope as close as needed to ensure upright head position.
- Working with elbows close to sides.
- Work with wrists in straight, neutral positions.
- Choose microscope eyepieces that allow improved head and neck posture.

To Control High Repetition:

- Take adequate breaks - even short several second “micro-breaks” help.
- Rotate microscope work between several employees.
- Evaluate work processes to spread microscope work throughout the day.
- Add personnel for peak periods.

To Control Contact Stresses:

- Do not rest forearms on sharp work surface edges; pad edge or forearm or create a forearm rest pad.

To Control Eye Fatigue:

- Keep scopes clean.
- Ensure illuminators are in alignment and light is even, and of proper intensity.
- Ensure optical components are in proper repair.
- Take frequent short breaks to rest your eyes; focus far away or shut eyes to change eye focal length.

For additional information, contact your Director of Safety & Security, Lynell Nolan at Telephone # (869) 465-4161 Ext.191 or lnoland@rossvet.edu.kn