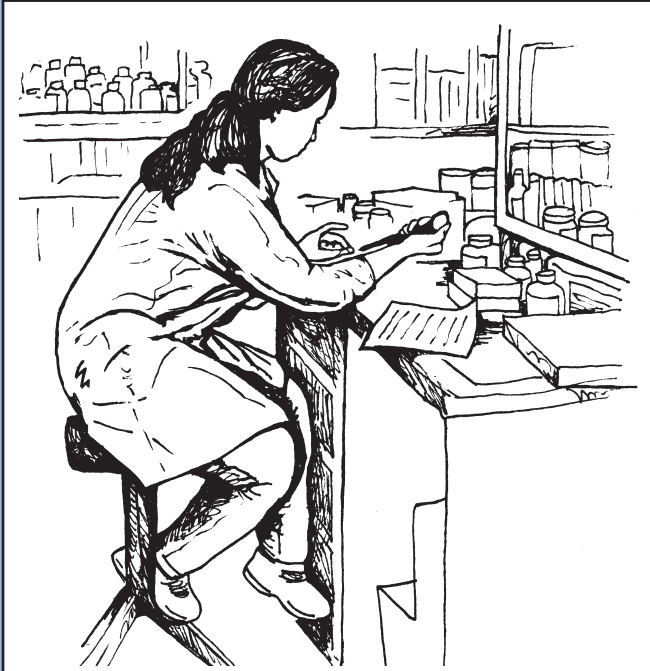


# LAB WORKERS

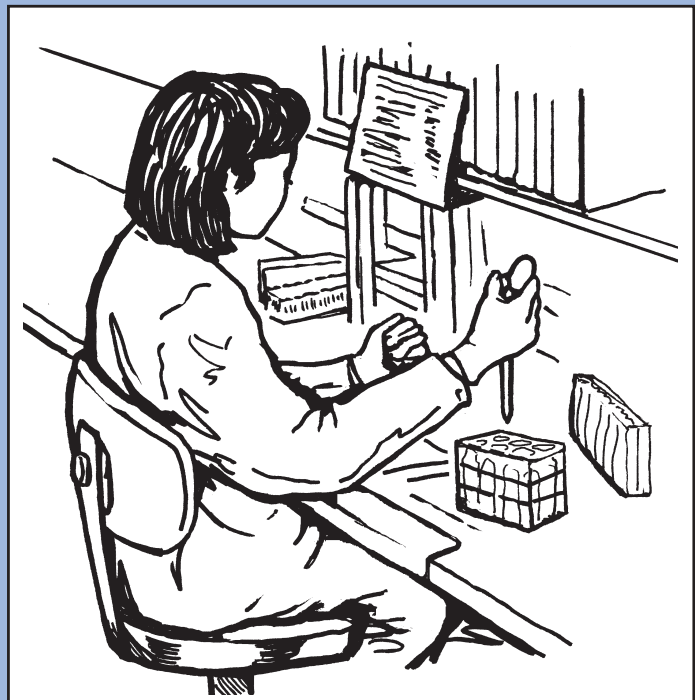


Unsafe equipment and poorly organized workstations can cause injuries.

## *Take the Pain Out of Pipetting*

- Causes and symptoms of pipetting injury
- Ways to prevent injury
- Choosing the right pipette

**There are many ways your work can be made safer for you.**



A workstation and equipment that help to prevent injuries

**NOVEMBER 2001**

## Is Your Job Causing You Pain?

- **Many pipette users experience pain, numbness, or tingling in their hands, fingers, or shoulders.** These symptoms may be related to your job.
- **Symptoms may start gradually.** However, if ignored, symptoms can get worse and become harder to treat. Symptoms may occur at night and still be work-related. Even if they go away during vacation or on your days off, it doesn't mean the condition is gone. Inform your employer and get medical care right away if you have symptoms.
- **The symptoms may indicate serious injuries** and can interfere with your work and personal life. They can even lead to permanent disability.



## Why Do Pipette Users Have These Problems?

- **Repeated motions** such as pipetting, reaching for supplies, and twisting to read protocols—over and over, all day long—can injure muscles, tendons and joints.
- **Pipettes that are heavy or require a lot of thumb force** make muscles work harder than they should.
- **Pipettes that don't fit you** because they are too long or too thin make you use too much force to grip them.
- **Long work hours with few breaks or little task rotation** mean your muscles and joints don't have time to recover.
- **An uncomfortable work position** such as bending your wrist for long periods or reaching too far for supplies can result in pain and injury.
- **Cold temperatures, vibrations and hard edges** can make injury more likely. Work in cold rooms, vibrations from vortexing, and leaning or pressing against hard lab benches for long periods are examples.

# How Can Injuries Be Prevented?

*By law, your employer must provide a safe and healthful workplace. Here are some things your employer and you can do to prevent injuries.*

- **Talk with others at work.** Do workers have symptoms? Are the causes of injury present? Does the employer know about preventive actions to take?
- **Reduce pipetting tasks.** Pipetting more than one hour a day increases the risk of injury. Review protocols to remove any extra steps. Look for new protocols that eliminate unnecessary pipetting. Rotate tasks, if possible.
- **Take micro-breaks** every 20–30 minutes if you pipette for long periods. Loosen your grip and relax your hands periodically.
- **Use pipettes that reduce your risk of injury (see page 5).**
- **Provide a cut-out or "V"-shaped lab bench** (if possible) to bring the work closer. Remove obstacles so knees fit under the bench.
- **Use chairs with adjustable backrests and seats.** The chair should support your back for work that requires you to lean forward.
- **Use adjustable footrests.** Footrings on stools may not be adequate.
- **Train** on safe work procedures and recognition of early symptoms of injury. An ergonomist can help with workstation evaluations and adjustments.
- **Organize your workstation before you begin to pipette.**
  - Position frequently used items to minimize reaching or leaning.
  - Use a tip disposal container that is lower than the container into which you're pipetting.
  - Post protocols straight ahead at eye level to prevent bending or twisting.
  - Pad hard edges or surfaces against which you rest your arms or legs.
- **Hold the pipette loosely.** Textured gloves may help.
- **Use as little force as possible** when putting on tips or pressing the plunger.



## Taking Action to Prevent Injuries

- **Form a safety committee.** It can be a big help in keeping your workplace safe. Get key people from both labor and management to participate. A successful committee is one that has strong employer support. An experienced ergonomic consultant can provide technical assistance. Here's what a safety committee can do:
  - Talk to workers and inspect jobs to find conditions that can cause injuries.
  - Encourage workers to report work-related injuries and symptoms to their supervisor.
  - Identify the jobs that have caused injuries.
  - Figure out how particular jobs may be causing injuries.
  - Develop practical solutions and recommend that management try them out on a few individuals.
  - Check to see if the changes are effective before recommending them for all affected jobs.
  - Monitor employees using new equipment and/or making other job changes.

## What Does the Law Say?

- **Your employer may have to follow a California rule about repetitive work. Find out:**

Were two or more workers injured within the last 12 months? The injured workers must have done the same type of work.

Did a doctor report that each injury is mainly caused by the job? Each worker can have a different diagnosis, as long as it's related to the same kind of repetitive work.
- **If the answer to both questions is "Yes," the employer must change the work or equipment to prevent injuries.** Worker training also is required.

This rule is called Repetitive Motion Injuries (General Industry Safety Order 5110). It is enforced by Cal/OSHA.

What is Cal/OSHA? It is California's Division of Occupational Safety and Health. This government agency investigates workers' complaints and answers questions about workplace safety rules. Complaints are confidential. Find the phone number in the blue Government Pages near the front of the phone book. Look under: State of California, Industrial Relations, Division of Occupational Safety and Health, Compliance or Enforcement.

For employers, California has the Consultation Service (**1-800-963-9424**). This agency explains workplace health and safety regulations, and helps employers comply with them. They do not cite or impose fines.

# Which is the Right Pipette?

- **Choose a lightweight pipette** that is cushioned or contoured to your hand.
- **Select pipettes that use your fingers to operate a trigger** instead of your thumb to press down a plunger. Pick a plunger with low spring pressure and short length of travel.
- **Use pipettes that fit.** If your hand wraps around less than half of the pipette, the pipette is too big. It is too small if your hand wraps around the whole pipette.
- **Choose a tip ejector that requires little force.** Use thin-walled tips for easy ejection. Use pipette-specific tips if possible. Avoid generic tips.

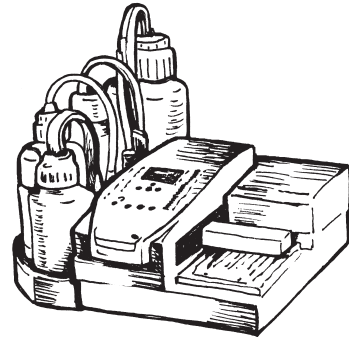
## 1 Automated

### **PROS**

- The best way to reduce injury
- Eliminates hand pipetting altogether
- Can be programmed to do repetitive pipetting tasks like ELISAs

### **CONS**

- The most expensive ergonomic option



## 2 Electronic Pipette

### **PROS**

- Lightweight
- Promotes better overall thumb and hand postures
- Eliminates forceful actions
- Some are also repetitive dispensers

### **CONS**

- Still involves repetition
- Expensive compared to some other ergonomic options
- Accuracy varies with the model



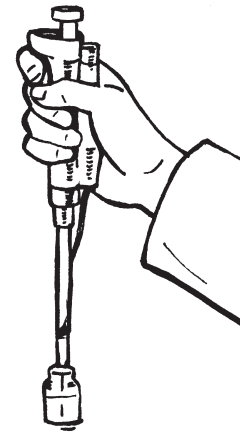
## 3 Latchmode™

### **PROS**

- Reduces repetitive plunging
- No need to continuously hold thumb down due to a magnetic assist

### **CONS**

- Thumb still in an awkward position when dispensing
- Some force still required



## 4 Repetitive Pipette

### **PROS**

- Dispenses the same amount of liquid repetitively with a minimal amount of refills
- Many use finger-operated triggers

### **CONS**

- Still requires repetitive thumb motions
- May require high force



## For More Information

- **HESIS (Hazard Evaluation System and Information Service).** Answers questions about workplace hazards and has many free publications available. [www.cdph.ca.gov/hesis](http://www.cdph.ca.gov/hesis)

**For information on workplace hazards: (866) 282-5516.** Please leave a message and your call will be returned.

### For HESIS Publications: (866) 627-1586

- *Guide to Getting Medical Care for Job-Related Pain That Won't Go Away.* Helps workers recognize symptoms that need treatment; choose a doctor; and work with health care providers, employers, and the workers' compensation system.
  - *A Physician's Guide to the California Ergonomics Standard.* Helps health care providers identify, document and treat work-related musculoskeletal disorders.
  - *HESIS Publications List.* Pamphlets and fact sheets on workplace hazards including chemicals, repetitive motion, and infectious diseases. Visit our website, call or write for the list.
- **Workers' Compensation.** If you are injured on the job, or work makes an existing injury worse, you may have a right to receive benefits such as medical care, wage replacement and retraining (if a job change is needed). Benefits are available to all workers, including immigrants, part-time and temporary workers. Call **1-800-736-7401** for more information and for free publications in English and Spanish:
    - Factsheet #1: *What Every Worker Should Know*
    - Factsheet #2: *After You Get Hurt on the Job*
  - **Cal/OSHA Consultation Service.** Helps employers to improve safety and health conditions without triggering enforcement inspections. Call **1-800-963-9424** for assistance or to ask for the booklet, *Easy Ergonomics* and other materials.
  - **NIEHS Health and Safety Guide to Laboratory Ergonomics.**  
See [www.niehs.nih.gov/odhsb/ergoguid/chapi.htm](http://www.niehs.nih.gov/odhsb/ergoguid/chapi.htm)
  - **UCLA Ergonomics** offers suggestions for lab workers.  
See <https://ergonomics.ucla.edu/laboratory-ergonomics.html>

**ABOUT THIS FACT SHEET.** This publication was produced by HESIS (Hazard Evaluation System and Information Service), Department of Health Services and Department of Industrial Relations, State of California. The recommendations in this fact sheet were developed by HESIS based on our evaluation of research studies and published information, and on general ergonomic principles. They may not be appropriate for every laboratory or individual laboratory pipetter.

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# HESIS

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& INFORMATION SERVICE**  
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