Choosing 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.

Automated pipettes are the best way to reduce injury because they eliminate hand pipetting altogether and can be programmed to do repetitive pipetting tasks. However, they are the most expensive ergonomic option.

Electronic pipettes are lightweight, promote better overall thumb and hand postures, eliminate forceful action, and some are also repetitive dispensers. However, they still involve some repetition, accuracy varies by model, and they are expensive compared to some other options.

Latchmode pipettes reduce repetitive plunging and there is no need to continuously hold thumb down due to a magnetic assist. However, the thumb remains in an awkward position when dispensing and some force is still required.

Repetitive pipettes dispense the same amount of liquid repetitively with a minimal amount of refills and have many use finger-operated triggers. However, they still require repetitive thumb motions and high force.

Getting Assistance

The recommendations in this fact sheet are based on research studies, published information, and general ergonomic principles and may not be appropriate for every laboratory. Contact EH&S for assistance, including ergonomic evaluations and recommendations.

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Environmental Health & Safety

Pipetting

Precision Without Pain

Using Pipettes

The pipette is a universal laboratory device for the volumetric measurement and transfer of fluids from one container to another. The following rules apply to all types of pipettes.

- Never put a pipette in your mouth.
- Draw the liquid into the pipette using a rubber bulb or pipette pump.
- Never withdraw a liquid from a near-empty container. If you attempt to fill a pipette under conditions where air can enter the pipette, the liquid will shoot up into the bulb or pump.
- Never lay a pipette flat on a table or turn upside down with the bulb or pump attached. The liquid will flow into the bulb/pump, contaminating the bulb/pump.
- Dispose of broken pipettes in the appropriate glass-disposal container (see SPPM S80.14).

Is Pipetting 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, but if ignored, symptoms can get worse and become harder to treat.

Symptoms that occur at night may 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 supervisor and get medical care 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 Pain?

Repeated motion 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 are too long or too thin require 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 (e.g., work in cold rooms, vibrations from vortexing, and pressing against hard lab benches for long periods).

Preventing Injuries

Injuries from pipetting, like other types of ergonomic injuries, can be reduced or eliminated through a few simple steps.

- Reduce pipetting tasks and review protocols to remove extra steps or unnecessary pipetting. Pipetting more than one hour a day increases the risk of injury, so rotate tasks, if possible.
- Take micro-breaks every 20-30 minutes if you pipette for long periods. Hold the pipette loosely and relax hands periodically. Textured gloves may help.
- Use a cutout or "V"-shaped lab bench (if possible) to bring the work closer.
- Use chairs with adjustable backrests and seats and position the chair to support your back for work that requires leaning forward. Use adjustable footrests, as foot rings on stools may not be adequate.
- Train on safe work procedures and recognition of early symptoms of injury. EH&S can help with workstation evaluations and adjustments.
- Organize your workstation and position frequently used items to minimize reaching or leaning, use a top 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, and pad hard edges or surfaces you rest against.
- Use as little force as possible when putting on tips or pressing the plunger.
- Use pipettes that reduce your risk of injury (see next section).