# RSI and YOU

## Is your science career at risk from pipetting?

**Have you experienced something like this?**

**Story #1 Wrist pain woes**

*"I did my whole Ph.D. with "normal" pipettes, resulting in greater and greater levels of wrist pain over the course of 5 years. By my second year of postdoc, it was bad enough that I would procrastinate experiments that involved pipetting, and I feared that I might have to give up experimental science and find a different career..."* *

**Have you ever heard something like this?**

**Story #2 Doctor said "stop pipetting"**

*"As a pluripotent stem cell researcher, I routinely spend a lot of time dissociating and passaging cells. The strain of triturating cells using normal pipettes caused a repetitive strain injury in my right hand. The pain got worse and worse over time, to the point that I could no longer perform simple tasks like writing with a pen or pencil. My doctor told me to stop pipetting, but of course, that is not a feasible solution in my profession..."* *

*Read full stories with happy endings below

## The pipetting problem

When thinking about ergonomic and pain issues in the lab, is there anything more relevant than pipetting problems, particularly for those labs invested heavily in manual liquid handling and cell culture? Simply put, repetitive motion and hand strain are serious issues. In addition to risk of RSI, accuracy and precision can be compromised and lab productivity can suffer as a result.

## RSI is no joke

Repetitive strain injury (RSI), sometimes referred to as repetitive stress injury, is a gradual buildup of damage to muscles, tendons, and nerves from repetitive motions. Under the right circumstances almost any lab activity is capable of inducing RSI. According to an article by certified ergonomist Kevin Costello on common disorders reported by laboratory workers, musculoskeletal movements involving repetition, contact stress, force, and awkward posture are the most risky. In other words, the entire range of motions involved in pipetting.

Read "Laboratory Workers Commonly Report Work-Related Musculoskeletal Disorders from the Use of Manual Pipettes:Ergonomic Science May Hold the Key to Prevention"

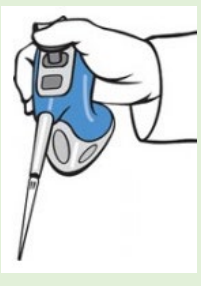
## Proper posture is key

Proper posture is the most important element in establishing good ergonomic practices. During repetitive tasks such as pipetting, maintaining body positions that provide a maximum of strength with the least amount of muscular stress is important to minimize the risk of injury.

### What you want

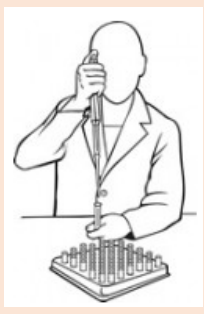
**Elbow close to body**
Position elbows as close to the body as possible, with arms and wrists in straight, neutral positions (handshake posture) to maximize available arm strength. Keep arm elevation low to minimize stress to the elbow, shoulder and neck. Arm/hand elevation should not exceed 12" from the work surface.

**Wrist in neutral position**
Keep forearm rotation angle near 45° pronation (palm down) and a neutral range of motion throughout all pipetting operations. Eliminate repetitive twisting of the forearm to reduce pressure on the carpal tunnel.

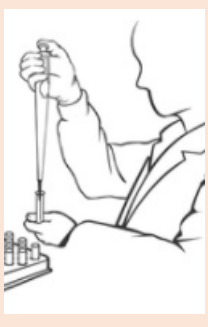


**A loose, relaxed hold**
A loose, relaxed hold helps increase available strength in the hand. Use pipettes with hooks or other attributes that allow a relaxed hold and/or alleviate the need to constantly grip the pipette. This will reduce tension in the arm, wrist and hand and increase endurance and productivity during pipetting.

### What you don't want



**Elevated "winged" elbow**
The average human arm weighs approximately 6% of the total body weight. Holding a pipette with the elbow extended (winged elbow) in a static position places the weight of the arm onto the neck and shoulder muscles and reduces blood flow, thereby causing stress and fatigue. Muscle strength is also substantially reduced as arm flexion is increased.



**Over rotated forearm and wrist**
Rotation of the forearm in a supinated position (palm up) and/or wrist flexion increases the fluid pressure in the carpal tunnel. This increased pressure can result in compression of soft tissues like nerves, tendons and blood vessels, causing numbness in the thumb and fingers.

**Tight grip (clenched fist)**
Hand fatigue results from continuous contact between a hard object and sensitive tissues. This occurs when a tight grip is needed to hold a pipette, such as when jamming on a tip, and results in diminished hand strength.

## The big question

Rather than designing a pipette to fit the performance hardware, why not approach the problem from the opposite perspective, i.e. engineer an ergonomically correct pipette and integrate the performance hardware to conform to this design?

## Ovation® Pipettes

VistaLab's patented design for Ovation Pipettes specifically addresses the problem of pain and Repetitive Strain Injury (RSI) from pipetting. We first engineered an ergonomically correct pipette holder, then integrated the performance hardware to fit the design. Accuracy and precision are not the only things you need from pipettes to get the results you need. Because if you're in pain, how accurate and repeatable can your pipetting really be?


**We did it "backwards"?**
VistaLab first engineered an ergonomically correct pipette holder, then integrated the performance hardware to fit the design.

## *Happy endings!

**Story #1 Wrist pain gone!**

*"I did my whole Ph.D. with "normal" pipettes, resulting in greater and greater levels of wrist pain over the course of 5 years. By my second year of postdoc, it was bad enough that I would procrastinate experiments that involved pipetting, and I feared that I might have to give up experimental science and find a different career. I made the switch to Ovation pipettes, and within a month my wrist pain was completely gone. I now have my own lab and will be urging all of my trainees to use Ovation pipettes from the beginning, hopefully avoiding the issues I had to go through."*

- Dan Dickinson, UT Austin

**Story #2 Hand pain gone!**

*"As a pluripotent stem cell researcher, I routinely spend a lot of time dissociating and passaging cells. The strain of triturating cells using normal pipettes caused a repetitive strain injury in my right hand. The pain got worse and worse over time, to the point that I could no longer perform simple tasks like writing with a pen or pencil. My doctor told me to stop pipetting, but of course, that is not a feasible solution in my profession. He then suggested using ergonomic pipettes instead of regular ones. I switched to Ovation M Manual pipettes and after only one week of using them the pain substantially reduced. The pain in my right hand is now completely gone and I feel normal again. These ergonomic pipettes are not a compromise in any way. Pipetting is accurate and reproducible. The tube opener in the bottom is also quite useful. I would suggest heavy pipettors to switch to Ovation BEFORE they develop strain injuries the way I did."*

- Margarete Diaz Cuadros, Brigham and Women's Hospital

Ovation®
The Better Way To Pipette

VistaLab™ TECHNOLOGIES
Think Differently. Feel Better.

**Designing products for your health so you can focus on the science.**