

# Handwriting

*"Constant writing ...fatigues the Hand and whole Arm, on account of the continual and almost tense Tension of the Muscles and Tendons. I knew a Man who, by perpetual writing, began first to complain of an excessive Weariness of his whole right Arm, which could be remov'd by no Medicines, and was at last Succeeded by a perfect Pally of the whole Arm. That he might sustain as little Loss as possible by the Accident, he learn'd to write with his left Hand, which was soon after seiz'd with the same Disorder."*

Ramazzini (1777) from *Essai sur les Maladies de Disseus*  
Original translation from Latin in "De Mortis Artificum" by M. De Foureau



Graphic provided by Doug Martin  
[www.pencilpages.com](http://www.pencilpages.com)

Over two hundred years ago, Ramazzini recognized that handwriters have a high-risk occupation. With today's focus on computer injuries, handwriting is rarely considered as contributing to overuse problems.

When held in a "death grip", a pen or pencil can contribute to upper extremity strain. Risk factors associated with writing can include excessive force, contact stress, and constrained or awkward postures.

Handwriting is deeply personal. We develop our own handwriting styles in concert with the way our brain signals fire in unique patterns that are remarkably constant for each person. Handwriting is a primal and unconscious act that can be tough to change.

Handwriting habits begin in childhood. Immature grips and awkward postures often develop when children begin writing too early. Once established, forceful grip patterns and awkward postures can continue into adulthood.

If workers report hand, wrist, forearm and shoulder pain, remember to check out their writing style in addition to their other work tasks.

## HANDWRITING DON'TS:

### 1. Don't hold a pen or pencil in a "death grip".

Too much force can cause joint pain, cramps, fatigue and muscle weakness.

If you write using small print, consider changing to a larger cursive style. Cursive writing is free flowing and requires far fewer strokes to complete.

### 2. Avoid white knuckles, excessive flexion, or hyperextension of the thumb and finger joints.

These postures can cause forearm strain and even elbow tendonitis!

### **3. Don't "plant" your wrist on the table when writing.**

Perching results in excessive finger motion to move the pencil.

Planting your wrist will also force you to stretch your wrist to reach across the paper to write.

### **4. Don't write with the elbow and wrist flexed.**

Left-handed writers are especially prone to these awkward postures.

### **5. Don't hold a pen while typing.**

Hyper-extending and spreading the knuckles can lead to finger pain.

### **6. Don't cradle a telephone while writing.**

Many people multitask without thinking. Attempting to write while cradling a telephone can be dangerous.



## **HANDWRITING DO'S:**

### **1. Use the right (write) tools!**

Choose low force writing devices. Replace standard ballpoint pens with easy flow ink fountain pens, roller ball pens or fine line markers. Make sure you don't have to press hard, and that the ink flows smoothly.

Select writing tools that fit your hand. Pens that are too small or too large can be hard to grip. Try different sizes before you settle on one that fits. Use tape, tubing or grips to increase the diameter of existing pens.

Writing tool surfaces can affect grip. Wrap adhesive or tubing around smooth barrel pens. Textured pen grips can reduce grip force. Place Leaf-It-Finger dots and grips on fingers to increase friction.

### **2. Maintain proper hand and arm position.**

Use your wrist and forearm to move your pen rather than your fingers. Excessive finger motions can result in tighter grips and tired muscles.

Write using neutral or straight wrist positions. Move your entire forearm while writing; your hand should float over the paper. Correct writing technique resembles proper mousing techniques, using the larger and more proximal muscles of your arm.

If necessary, re-orient or slide writing paper up as you write in order to relax your wrist and move your forearm to a neutral position, especially for left-handed writing.

Keep your forearms close to the “handshake” position when writing. Resting on the little finger side of the hand can result in awkward wrist postures.

Write with your elbow in an open angle (more than 90°). Excessive elbow flexion can strain tendons and nerves in the arm.

### **3. Position writing materials close.**

If multi-tasking, evaluate how you use work tools and materials. If you write frequently, place writing materials within easy reach.

For example, when writing on documents placed on a desktop over a keyboard tray, push the tray in close to the desk to reduce reach. Writing stands that lower below the desk can also help bring documents within easy reach.

If writing more than keying, consider using your keyboard on the desktop and place documents in front of the keyboard.

Consider using a writing platform directly above the keyboard to reduce reach. The Microdesk writing platform is an example of a platform that can be used above the keyboard.



### **4. Position writing materials on surfaces 2 inches above seated elbow level.**

Writing on surfaces slightly above seated elbow height helps to maintain an upright posture.

### **5. Consider sloped desks or writing platforms.**

Desktops that slope between 15° and 25° can reduce neck flexion and forward sitting (anterior) postures.

If sloped desks are not available, try writing on angled platforms or use a horizontally placed 3” binder notebook. Position the binder edge away from you.

### **6. Optimize your workstation design.**

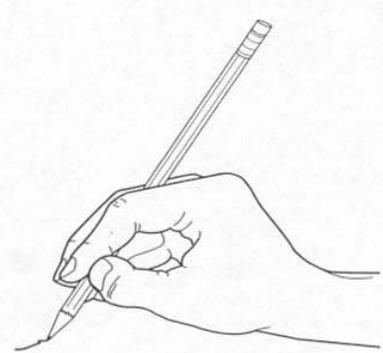
Consider desks with cockpits or side extensions on the dominant side. Place writing materials directly beside you and within easy reach.

The chair-desk relationship is important. Make sure you can pull your chair up close to the desk to work. If you can't get close enough, consider sitting parallel to the work surface to write.

Set up a work area so you can alternate sitting and standing to read and write for a posture change. Use a file cabinet to position materials.

## 7. Try to vary grip patterns to rest muscles.

Hold your pen between middle and index fingers, rather than between your thumb and index finger. This can help if you experience thumb pain or have arthritic joints.



Tape can provide feedback to reduce excessive grasp when writing. Apply tape loosely over the top of the thumb and index finger while holding the pen in a relaxed grip. The tape will pull when you increase force to remind you to relax.

Hold the end cap of a magic marker lengthwise between your ring and little finger and your palm. Pick up your pen, and continue to maintain a loose grip on the cap.

Anatomically, most grip force comes from the ulnar (small finger), side of the hand. Holding the cap inhibits the grasp reflex and reduces tension when writing. Try using this technique for 5 to 10 minutes at a time. You may need to practice relaxed grip patterns for a few weeks.

## 8. Left-handers have special issues.

Some left-handers use the “hooked” style of writing as they attempt to see and/or avoid smearing as they write.

Use these tips to improve writing technique:

- Grip the writing device far enough away from the point (about 1-1 ½”) to see what is being written. This also helps avoid smearing.
- Tilt the paper so your arm is at a right angle to the bottom edge of the paper. Position the top right corner closer to you when you write.
- Keep your hand below the writing line and your wrist straight.
- Don't worry about writing with a right slant. Upright or left-slanted letters are just as easy to read.

Writing can be a potentially harmful repetitive task involving awkward postures and excessive force. Select appropriate tools and set up “writing friendly” environments to avoid injury. Write at a reasonable pace, and take frequent breaks to rest and change postures.