Preventing Musculoskeletal Disorders

Vol. 20 • Issue 14 • Page 25
Preventing Musculoskeletal Disorders
Intervention can lead to better employee health.
By Franklyn Fraser
Typing at a computer, adjusting a microscope and loading a centrifuge: they all seem harmless at first glance. Compared to intense labor requiring heavy lifting, a laboratorian's work seems relatively safe, doesn’t it?
Perhaps not.
The frequent, repetitive tasks common in the laboratory can cause numerous painful and potentially crippling musculoskeletal disorders (MSDs). So what can laboratorians do to reduce the risk of developing MSDs? More and more labs are utilizing ergonomics to increase employee comfort, productivity and safety while decreasing MSD occurrences in the lab.

Root Causes
Sarah Cooney, OTR, ergonomics program coordinator for the Occupational Safety and Environmental Health Department, University of Michigan, Ann Arbor, said ergonomics in the laboratory is important because the work has moved from a single bench to larger environments, with similar risk factors as those in manufacturing jobs.
"Lab workers may sit at one lab station for 5-6 hours at a non-adjustable counter height completing repetitive tasks for the duration of their shifts," Cooney said.
"There is also a misconception only labor involving heavy lifting (excessive force) causes MSDs, which tends to overlook the other MSD risk factors including repetition, awkward or sustained postures, contact stress, vibration and temperature extremes," she added. "Workers exposed to a combination of these risk factors over time are simply at risk for developing MSDs even if their job does not require heavy lifting."
Cooney also suggested three simple ergonomic interventions laboratorians and supervisors can enact to decrease job-related injuries (see Three Ergonomic Interventions).

Promising Outlook
Ergonomically designed laboratories can help reduce work-related injuries, thereby decreasing the days staff members miss due to on-the-job injuries. In 2006, The Bureau of Labor Statistics (BLS) reported employees who developed MSDs lost an average of 9 work days.
Between 2003 and 2006, the MSD occurrence rate per 10,000 full-time workers declined more than 20 percent.¹ Do these statistics indicate employers are now utilizing more ergonomically designed products in all industries?
Cooney believes MSDs in the workplace have decreased due to several factors:

- increased awareness by front-line lab workers, supervisors, managers, designers and manufacturers;
- remodeling or updating with improved technology and products; and
- managers instituting administrative controls to allow production lab workers to rotate jobs within the laboratory to reduce repetitive body motions.

"More care is taken to keep skilled workers on the job by accommodating their needs," Cooney said.

Early Intervention
Martha Casassa, MS, CLD(NCA), MT(ASCP), laboratory director at Braintree (MA) Rehabilitation Hospital, said she has neck and shoulder pain from non-ergonomic computer work.
"Two staff members at my facility have mild hand and wrist issues also from using the computers
non-ergonomically," Casassa said. "Anecdotally, it appears most issues have arisen due to increased computer use.

Whether resulting from using computers, cytometers, pipettes or fume hoods, MSD symptoms can be pre-emptively identified. Laboratory workers should recognize early MSD symptoms to take preventive measures. Early intervention can mean the difference between a simple equipment adjustment and surgery for the following common MSDs.

**Carpal Tunnel Syndrome**
Carpal tunnel syndrome is perhaps the most well-known MSD caused by a painful compression of the median nerve running from the forearm into the hand.\(^2\) Symptoms include tingling or numbness in the hand; pain radiating or extending from the wrist up the arm to the shoulder or down into the palm or fingers, especially after forceful or repetitive use; a sense of weakness in the hands and a tendency to drop objects; and a constant loss of feeling in some fingers.\(^2\)

**Rotator Cuff Tendinitis and De Quervain’s Tenosynovitis**
Tendinitis can occur in any of the body’s tendons, but for laboratory workers, the disorder commonly occurs in the wrists, elbows or shoulders. Rotator cuff tendinitis is an inflammation of the tendons in the shoulder caused by overuse. Symptoms include pain, tenderness and mild swelling in the joint.\(^3\) De Quervain's tenosynovitis causes pain in the wrist or hand and occurs when the tendon's sheath on the wrist's thumb side becomes inflamed or swollen.\(^4\) The condition can cause pain and discomfort when turning the wrist or making a fist. De Quervain’s tenosynovitis can be caused by the forceful grasping and turning involved with volumetric handling.

**Trigger Finger**
Caused by the narrowing of the sheath surrounding a tendon in a finger, trigger finger is a condition causing one's thumb or finger to catch or lock in a bent position.\(^5\) People whose work or hobbies require repetitive gripping actions are more susceptible to the disorder, and trigger finger is more common in women and diabetics.\(^5\) Symptoms include stiffness in the finger and tenderness in the finger's base. The condition can occur in more than one finger and most commonly affects a person's dominant hand.

**Ganglion Cyst**
Ganglion cysts may occur suddenly or develop gradually, and are non-cancerous fluid-filled lumps appearing along tendons or joints in one’s wrists or hands. They can be painless and disappear on their own, but in some cases, they may put pressure on the nerves near a joint.\(^6\) Adjusting microscopes may contribute to the development of cysts, but the exact cause is unknown.

**Thoracic Outlet Syndrome**
A persistent, sharp pain in the shoulders and neck could be a sign of thoracic outlet syndrome (TOS). The MSD is generally subdivided into three categories: neurogenic, vascular and nonspecific.\(^7\) Neurogenic TOS is characterized by the compression of a nerve network derived in the spine controlling the shoulder, arm and hand. Vascular TOS occurs when the arteries and veins under the clavicle, or collarbone, are compressed. The nonspecific, or disputed, TOS is characterized by pain in the thoracic outlet area without an identifiable cause, and physicians disagree on nonspecific TOS’s existence.\(^7\)

**Prevention**
Avoiding repetitive movements can be difficult when working in the lab. Give yourself short breaks between tasks and note any sudden pain or tingling. Improving your posture while working can reduce your risk of developing most MSDs. Bad posture leads to increased stress on your neck and shoulders, which can cause arm and wrist pain.

Many facilities have an Occupational Health and Safety department to oversee the day-to-day activities, ensure safety and prevent injuries. Casassa said her facility's Occupational Health Department reviews any department that has the potential for employee injury.

"Labs can poll employees to see where their concerns lie as a starting point," Casassa suggested. "Physical therapy departments are also a good resource for what constitutes good body mechanics. When considering preventive measures against trigger finger, carpal tunnel syndrome and de Quervain's tenosynovitis, ergonomically designed equipment can reduce your chances of developing several MSDs.

VistaLab Technologies, Mt. Kisco, NY, created an ergonomically designed pipette—;the Ovation...
Several years ago to increase pipetting comfort. According to David Metrena, director of sales and marketing at VistaLab, "The Ovation brings the arm down to a neutral posture and has an almost globally accepted grip." The Ovation's goal, Metrena said, was to improve laboratory equipment people often take for granted. "It's better for the person from an ergonomic standpoint," he added. Ergonomic equipment and workstations can reduce employee injuries and increase profit (see Ergonomics=Economics on the Web). "In today's laboratory environment, you want to keep your staff healthy and working, not out on a leave due to workplace injury," Casassa said. "Proper ergonomics is a sound investment." n

Franklyn Fraser (ffraser@advanceweb.com) is an editorial intern at ADVANCE.

Three Ergonomic Interventions
Sarah Cooney, OTR, ergonomics program coordinator for the Occupational Safety and Environmental Health Department at the University of Michigan, Ann Arbor, told ADVANCE about the three simple interventions used by ergonomists at any work location:

1. Engineering controls: Changes to the environment or to the tools used.
Employers could save financially and prevent injuries by consulting an experienced ergonomic professional in the planning stages of remodeling labs or purchasing new equipment. Simple solutions, such as eye cup extensions for microscopes to keep employees from pushing their necks forward to view specimens; handled beakers to reduce the repetitive grip of volumetric handling; and chairs supporting an employee in a forward-leaning position to reduce stress on the upper back/neck are now available.

Administrative controls might include task rotation, or limiting shift length or overtime. Additional staff could be hired or cross training undertaken to allow for widespread rotation within the lab. Sometimes, management is simply unaware employees have great ideas on how to modify a specific area to reduce discomfort. Many ergonomic fixes do not cost a penny and simply involve rearranging what is already in place.

Simple fixes, such as raising the chair/stool height or the foot ring to fit right can protect workers. Employees should take breaks as appropriate and be familiar with safety equipment. Specialized stretches should be reviewed with staff as well as alternative methods of holding specific tools.

—Sarah Cooney, OTR