Is IT Hazardous to Your Health?

Recognize the risks and keep yourself safe

TechRepublic

A special report

Contents

Introduction

Stress, burnout, and work/life balance are examples of employee issues that you'll find in any work environment. However, IT professionals may encounter a few extra health problems—such as repetitive stress injuries, illness resulting from contact with user-borne viruses, eye strain, back pain from moving heavy equipment, severe dust allergies, and possible exposure to toxic substances, such as mercury, lead, and PVC.

We put together this TechRepublic special report not to be alarmists, but to let you know about some of the health and safety risks you may encounter, along with measures that you (and your company) can take to reduce or eliminate those risks.

TechRepublic contributors Debra Littlejohn Shinder, Dr. Thomas Shinder, Suzanne Thornberry, Jeff Dray, Kris Littlejohn, and Becky Roberts bring their IT and medical industry knowledge to a variety of IT health concerns, from ergonomics to sleep deprivation to illness prevention to self-defense tactics. We've also included data from our recent Health and IT survey—and some of the results may surprise you.

10 IT health risks—and how to combat them

Everybody seems to understand that movers and construction workers can have serious back and neck problems from their strenuous work. But when you sit at a desk most of the day, people aren't necessarily as sympathetic when you moan and groan about your spine, your sore throat, or your mood. Based on anecdotal evidence gathered in various workplaces, here are the top ailments people in a typical IT office may face.

#1: A slug's life

When the only body part you move in your job is your mouse finger, you just have to take fitness into your own hands. Do you have to train for a marathon to lose some weight? Not at all, according to Dr. James Levine of the Mayo Clinic. He found that the time spent sitting was more likely to correlate with weight gain than the lack of vigorous exercise. You can keep slim, according to Levine, by walking slowly (about 0.7 mph) two to three hours a day.

Although few of us can stroll around the neighborhood that long, several companies have developed workstations with treadmills attached so you can pseudo-walk while you check your e-mail or debug code. It all makes CNET's Mike Yamamoto wonder if there's a conspiracy to tether workers to their desks. You can download several tools from TechRepublic to help you evaluate and manage your weight, including a body mass index [BMI] calculator.

#2: SIT happens

Weight gain can creep up on you, but it's not an emergency in itself. A much more serious hazard of office work is seated immobility thromboembolism (SIT). This problem occurs when blood clots form in the legs (deep vein thrombosis) or lungs (pulmonary embolism) in people who spend a long time sitting. People may develop these clots while on a long trip, if they don't get out of the car or stroll around in the plane's cabin a bit. CNET noted the risk of deep vein thrombosis increasing back in this 2003 article. More recently, results of a New Zealand study suggested that a sedentary job may double the risk of developing clots in the legs (DVTs) or, even more dangerous, clots in the lungs.

#3: So many headaches

From the flicker of fluorescent lights to the hunched-up debugging posture, the conditions of your cube farm conspire to cause headaches. Pagers, end users, and the threat of outsourcing provide additional stress to kindle a dandy migraine or tension headache. Downing Tylenol or ibuprofen several times a week can backfire by making your pain more tenacious. If you get in a pattern of frequent headaches, see a doctor to get out of the rut.

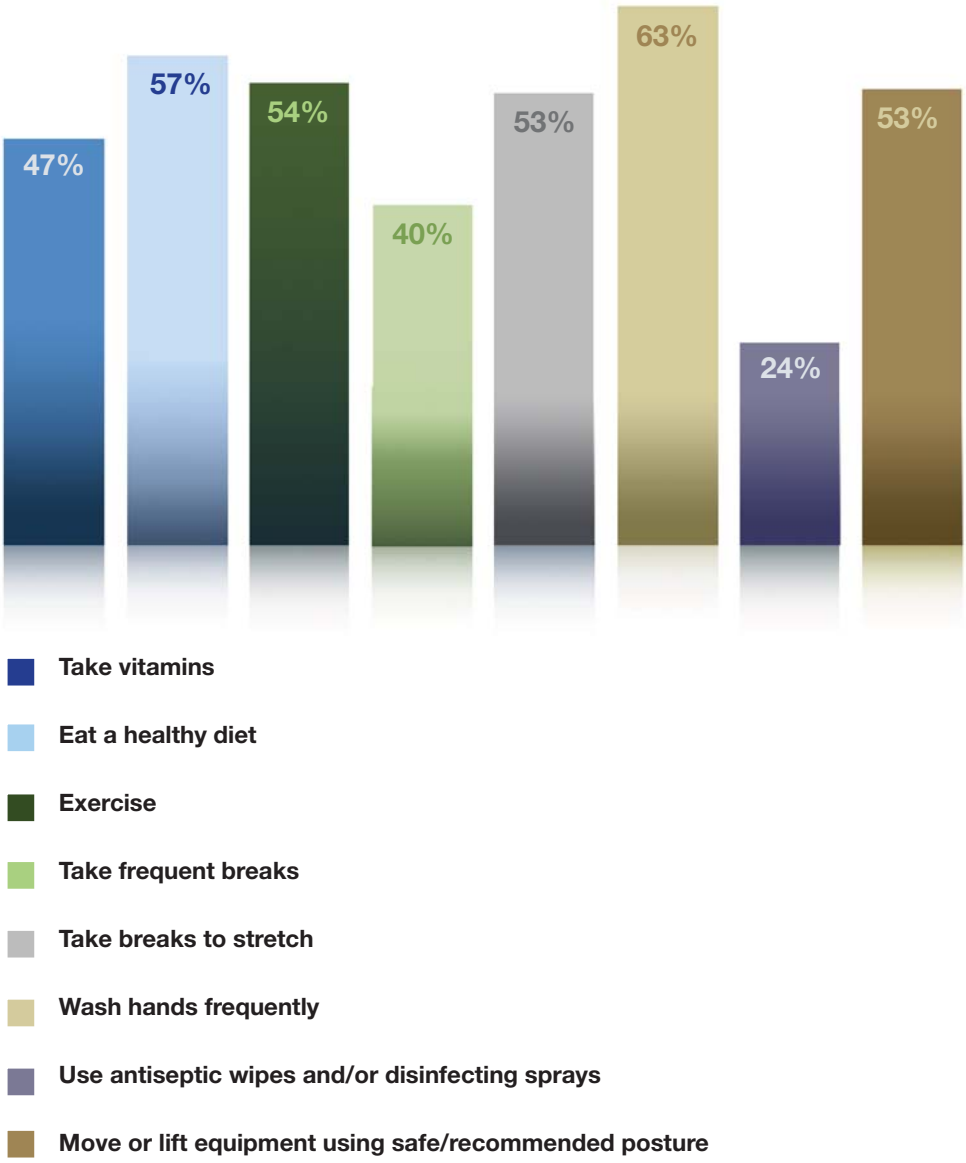
You may have tension headaches, which can be treated with massage or stretches to help relax your muscles. Migraine is another possibility. Even if you don't have the visual disturbances (auras) that are the hallmarks of a "classic" migraine, you may have a common migraine. The good news is that there are many medications you can try to treat and prevent migraines. Although some are quite expensive ($25 or more per dose), treat the headaches aggressively. Migraines can affect your mood, your threshold of pain, and perhaps even your risk of stroke.

#4: The bobblehead syndrome

Do you nod off frequently at your desk and perhaps even have brief dreams? These episodes, called microsleeps, may indicate you're sleep deprived. It's natural for the human body to crave a siesta after lunch, but excessive daytime sleepiness needs to be treated. Most adults need seven to eight hours of sleep a night, so simply going to bed earlier may be all you need.

If you're in the sack long enough but are still tired, consider your environment (a snoring spouse, a hot or

Figure 1: What do you do to stay healthy?



Source: TechRepublic's IT Health Survey
Check out all the results.

cold room). Crying babies and pagers can jar you out of sleep and seriously disrupt normal sleep cycles. Sleep apnea is a fairly common but scary-sounding problem: People with the disorder briefly stop breathing, often hundreds of times a night, which disrupts normal sleep phases. Physical abnormalities that cause excessive snoring can also lead to poor sleep. So check with your doctor, who may refer you to an ear, nose, and throat specialist or sleep clinic to sort out your sleep problems.

#5: Hurting hands

Although your hands and wrists may be sore from intensive typing, there's not a whole lot of evidence to link keyboard use to carpal tunnel syndrome (CTS). A 2007 study of men who worked at video display terminals found an association of CTS with high body mass index (BMI) and job seniority—but not with specific tasks related to computer usage. Still, many conditions other than CTS can make your hands and wrists hurt, so it's wise to check with your doctor to try to get some relief.

"How is it that sitting on your chair and looking at a monitor can make your back, neck, and shoulder muscles feel like you've spent eight hours painting a ceiling?"

Severe carpal tunnel syndrome is usually treated with surgery, but many other conditions that cause hand pain don't require such drastic treatment. Tendonitis, for example, is a fairly common cause of hand pain that may be treated with anti-inflammatory drugs (such as ibuprofen or naproxen) and splinting.

#6: Relax harder!

How is it that sitting on your chair and looking at a monitor can make your back, neck, and shoulder muscles feel like you've spent eight hours painting a ceiling? Your tense posture may be part of the problem. Improving the ergonomics of your work area may help take the stress off your upper body. Try not to transfer the tension in your mind to your muscles and take a break now and then to unclench.

#7: Noxious invaders

The dry air of a typical office certainly doesn't help your immune systems ward off your coworkers' coughs, but hey, at least you're not sitting in a daycare center. There are hundreds of cold viruses, plus several influenza viruses each year. What can you do to stay healthy and help keep your coworkers healthy, too?

- Stay home for a change.
- Clean your keyboard, mouse, and desk.
- Wash your hands.
- Keep hydrated.

No replicable scientific studies have proven that vitamin C, Echinacea, or zinc will prevent or shorten colds, but many people swear by them.

As far as gastrointestinal illness goes, remember that the most common transmission route is fecal-oral. So, for God's sake, wash your hands after going to the restroom. Also, consider the effective, but possibly neurotic, act of opening the door with a paper towel when you leave.

#8: Eye strain

Watching a backlit screen two feet away for four hours at a time isn't really natural, is it? So it's no surprise that people in IT complain about irritated eyes and declining visual acuity. Here are some suggestions that may help:

- Remember to blink. Yes, blinking is pretty much automatic, but some people really keep their eyes peeled when they're engaged in work. Their eyes dry out, which is extra hard on people who wear contact lenses. A few drops of artificial tears can make your tired eyes much more comfortable.

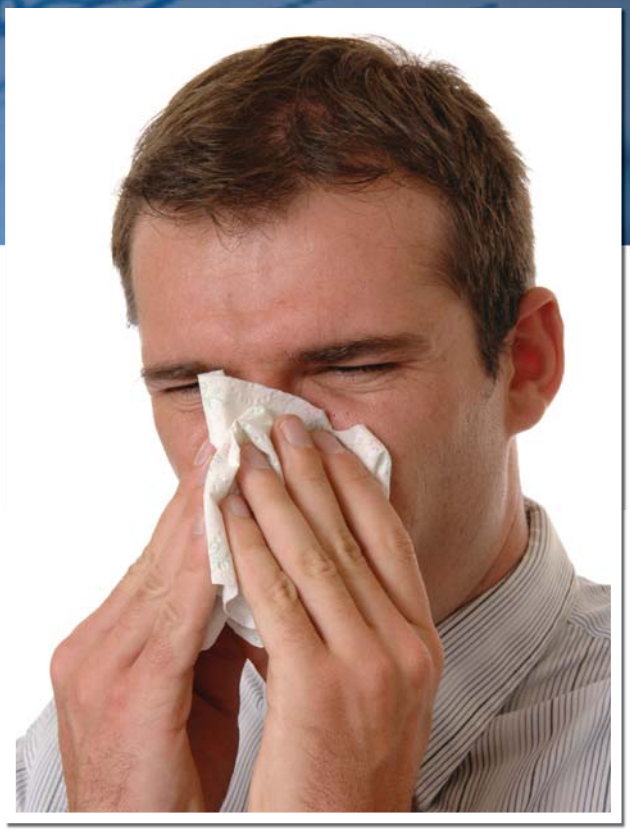
- Change your focus. Look out the window or down the hallway—anything to get away from your two-foot focus. There are even programs designed to remind you to give your eyes a break.
- Get an eye exam. Your doctor may have more tips to help you feel more comfortable as you work. And everyone needs to be screened for glaucoma and other eye diseases anyway.

#9: Heavy lifting

If your job requires you to lift, lower, and/or carry equipment around, you might find yourself battling back pain. Maybe you spend your days installing workstations or inserting/removing computers from racks—and if you're used to the work and know the right way to protect yourself in the process, you might not have any problems at all. But if it's an occasional task, or if you don't follow some basic precautions, you could wind up with a painful injury or chronic back trouble.

Despite the fact that best practices for lifting are largely common sense, people often ignore them—and often wish they hadn't. Here are some basic recommendations for protecting your back:

- Examine an object before you try to pick it up to determine how awkward and heavy it is. Tip it a little to test its weight and make sure you have a comfortable, secure way to grip it.
- If you think an object might be too heavy for you move, find an alternative: Get someone to help you, unpack or dismantle the object and move it in pieces, use a dolly, etc.
- Don't extend your arms when you pick up or lower a heavy object. That puts a big strain on your back.
- Watch your footing—the last thing you want to do is stumble or trip while carrying something heavy.



- Lift correctly. Keep your back straight, kneel to pick up the object, and then lift using your leg strength, not your back.

#10: Something in the air

If you work on a lot of systems, you're no stranger to dust. Even a well-maintained machine in a clean, ventilated area is going to pull in plenty of it. And if you work on customers' computers or make a lot of workstation calls, you're going to feel like Tom Joad before long.

This may not faze you at all, but if you're like many techs out there, it could spell big-time allergy, respiratory, and sinus woes. Among the suggestions from veteran dust-sensitive IT pros: Put on a dust mask before opening a case (or crawling around under a grubby workstation). And if you plan to use compressed air to blow some of the dust out of the case, definitely mask up first. You might also want to consider vacuuming that dust out rather than blowing it around—but you should use an ESD (electrostatic discharge) safe vacuum designed for electronics.

What IT pros should know about exposure to hazardous materials

When you think about hazardous materials handling, you may think about people who work at chemical companies or nuclear power plants. But IT professionals work every day with equipment that contains toxic materials. That's why disposing of old computer and electronics equipment can be a challenge.

To protect yourself and others from exposure to potentially dangerous substances, and to avoid liability for violating environmental regulations, you need to know about the risks posed by various devices and supplies and how to minimize those risks.

Generally, electronic waste is classified as hazardous if it contains components that are toxic (poisonous), ignitable/combustible, corrosive, or reactive. Most electronic devices contain heavy metals, such as lead. If the hazardous components get into landfills, the hazardous substances can then get into the soil and perhaps seep into the groundwater.

Legal issues regarding hazardous substances and hazardous waste handling

The Restriction of Hazardous Substances (RoHS) directive is EU legislation that bans the use of certain substances or regulates the amount of certain substances that can be used in electrical and electronic equipment. There is no equivalent federal law in the United States, but California's Electronic Waste Recycling Act (EWRA) is based on the RoHS directive, and other states are considering similar laws.

In the United States, the Environmental Protection Agency (EPA)'s Resource Conservation and Recovery Act (RCRA) was passed in 1976. It lays out federal regulations for disposing of materials that are regarded as hazardous (as well as other types of waste) and has been amended to strengthen the laws three times – in 1984, 1991, and 1996.

Each state also has its own regulations regarding how to handle hazardous waste materials. In many cases, these are more restrictive than the federal laws. The EPA offers a list of links relating to hazardous waste disposal in the various states and territories.

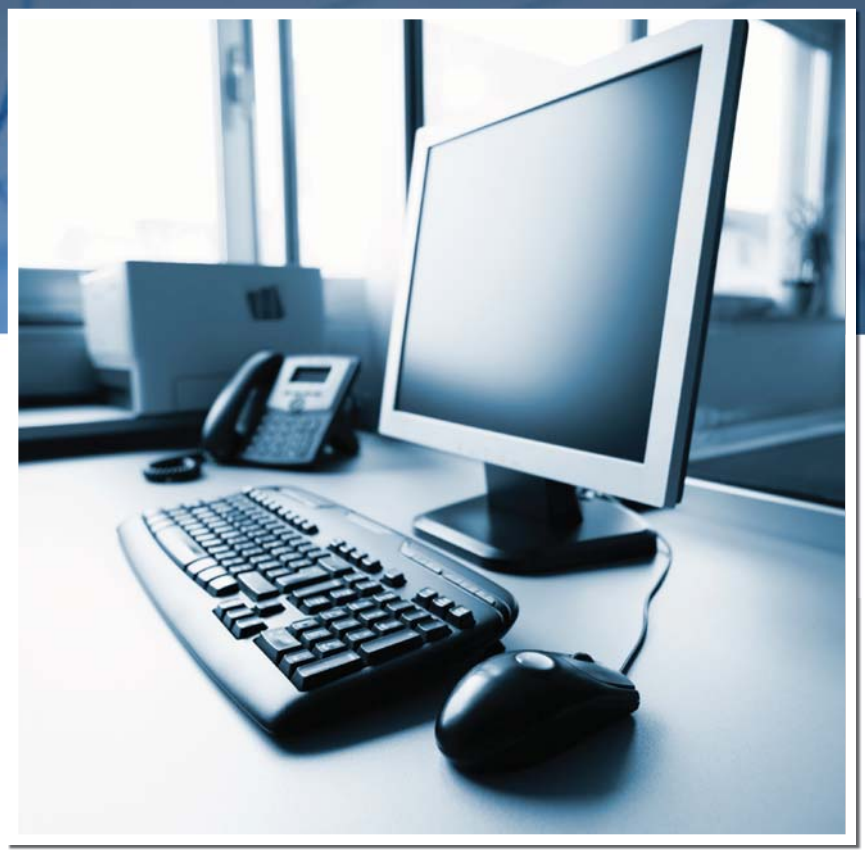
What's inside those computers that poses a risk?

When you open up a computer's case, what do you see? The motherboard, memory modules, video cards, sound cards, and so forth are all made from circuit boards. And circuit boards often contain poisonous metals that are used in the manufacturing process, including mercury and lead. Both of these can have profound health effects in humans.

Mercury toxicity is such a problem that some countries have proposed banning the metal completely. Mercury poisoning causes damage to the central nervous system, liver, and other organs and causes impairment of the senses (vision, speech, and hearing). Lead toxicity can cause anemia, irreversible neurological damage, cardiovascular effects, gastrointestinal symptoms, and renal disease. Although merely handling computer components does not constitute a dangerous level of exposure to these substances, the effects are cumulative—and we are already exposed to lead and mercury through other sources, such as household products, paint, and food (especially fish).

The internals of computers can also contain bromine, and polyvinyl chloride (PVC) may be present in the plastic coatings on cables. Bromine-based products have been suspected of causing hypothyroidism, as well as Attention Deficit Disorder and other behavioral problems in children. Toxic substances called phthalates can leach out of PVC products. Phthalates have been linked in some studies to kidney and liver damage, and some phthalates have been labeled carcinogens by the EPA.

Older workstations, servers, and laptops pose the greatest hazard. In recent years, many computer manufacturers have moved to reduce the toxic components in the systems they sell. When buying new systems, reduce the risk by purchasing those that are selected by EPEAT (the EPA's Electronic Product Environmental Assessment Tool).



Monitor mayhem

I vividly remember the sticker on the back of one of my first CRT monitors. It basically said, "Don't open this case or I will kill you." Cathode Ray Tube computer monitors and TVs contain capacitors that can hold a charge of hundreds of volts for a long time after the device is unplugged. Additionally, there is a vacuum within CRT monitors that can cause an implosion if the glass is broken. Finally, CRTs contain phosphors and barium compounds, which are toxic, and the glass may be leaded.

Most people are aware of the dangers posed by old CRTs, but they may not be aware of the fact that modern LCD flat panels can also pose a hazard. In fact, liquid crystal display screens may also contain lead, as well as copper at levels in excess of regulatory limits. The backlight may also contain mercury.

Batteries and other consumables

There are many types of batteries that you may run across in your job as an IT pro, from AAA dry cells that go in wireless keyboards and pointing devices to the large batteries that power uninterruptible power supplies (UPSs). Some are classified as hazardous goods and others aren't. In general, the common AAA, AA, C, and D cell batteries are not, but they can still pose a threat of fire from short circuits if you don't ensure that the terminals are properly covered.

Lithium and lithium ion batteries such as those in many portable computers and cell phones can overheat and ignite if you drop them or if they receive a blow or if they short-circuit. For this reason, some delivery services have special regulations governing shipments of these batteries.

Some UPS devices and some older computers use lead acid batteries (like car batteries). These contain sulfuric acid that's very corrosive and can pose a big danger if they leak.

Batteries also contain heavy metals, including lead, mercury, nickel, and cadmium. Nicad (nickel cadmium), silver oxide, mercury oxide, some zinc carbon, and even some alkaline batteries are considered to be hazardous waste under various state laws.

Batteries can be recycled, and it's best to take used batteries to a recycling facility. If that's not possible, you may need to take them to a hazardous waste disposal facility.

Other consumable supplies, such as printer cartridges, can also contain hazardous materials and should be recycled or disposed of in accordance with proper procedures, not thrown into the trash. Inkjet inks and laser toner dust can contain harmful chemicals, and the cartridges themselves often contain PVC and bromine-based flame retardants.

Other hazards in the server room

It's not just the computer equipment and supplies that can pose a hazardous materials risk. The server room itself may have components that require special handling and disposal. We've already mentioned that PVC can be hazardous, and you'll find it in many places. Ethernet cables are often jacketed in PVC, and PVC pipes are sometimes used as conduits for running cable. Lead-based heat stabilizers are added to PVC for wiring and cable applications, as well. And the wires inside the cable are usually copper.

Many companies have switched from using traditional incandescent light bulbs to compact fluorescent light (CFL) bulbs. These use far less energy and produce considerably less heat; however, CFL bulbs—like other fluorescent lights—contain mercury, and some states and local governmental entities have outlawed disposing of them in the trash. It is important to avoid breaking them, which releases the mercury.

If your server room is in an old building, there may be additional hazardous materials such as lead-based paint or asbestos in the insulation or acoustical ceiling. Cleaning solvents used to clean the floors can also be sources of risk.

IT pros beware: Sleep deprivation can spell big trouble

According to a recent study, American adults are sleeping on average less than seven hours a night — down an hour and a half from the amount of sleep people got a hundred years ago. Many scientists believe that one of the major causes of our getting less sleep is the modern availability of round-the-clock activities and entertainment, the most pervasive source of which is now certainly the Internet. With the 'net, we can work, study, or play at 3 A.M. and increasingly, we do. Naturally, most of us in the IT industry have formed an especially close bond with the 'net, making us more prone to losing sleep.

The fast-paced, highly competitive, and rapidly growing nature of our industry also makes us more likely to sleep less. To stay competitive, we often have to work way beyond the 40-hour work week, especially at smaller or emerging companies. For those who have started their own businesses, it's even worse — work will usually go until exhaustion. To compound the issue, the field is still developing and changing so rapidly that we have to constantly study as if we were full-time students just to keep up. It's really no wonder we're not sleeping. There just isn't enough time in the day. The problem is that this lack of sleep can hurt us.

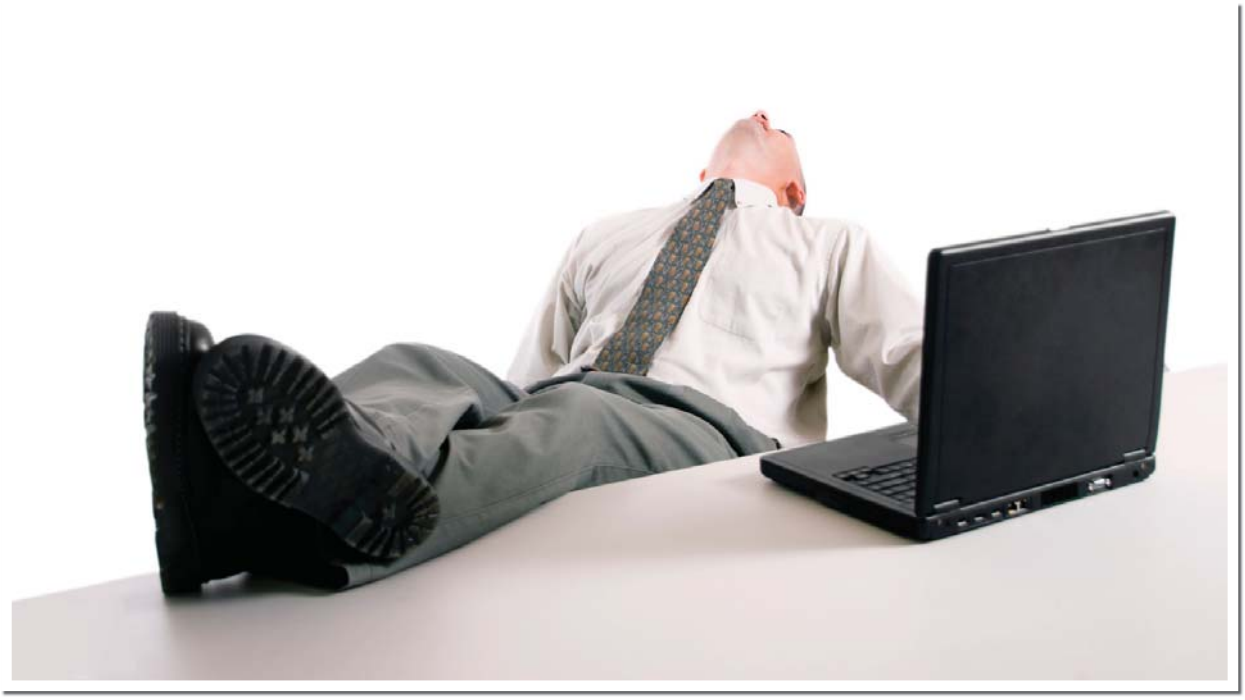
Sleep deprivation and sleep debt

Sleep deprivation is exactly what it sounds like: depriving our bodies of sleep for long periods of time — a full day and night or more. Sleep debt has a cumulative effect: When we don't get enough sleep (less than about 7.5 to 8.5 hours) night after night, we begin to experience many of the same problems as with regular sleep deprivation. These problems include

- Decreased alertness and manual dexterity
- Impaired memory and cognitive function
- Irritability
- Weakened immune system

Some more long-term issues thought to be linked to sleep deprivation include

- High blood pressure
- Diabetes
- Obesity



If the long-term health risks aren't enough to encourage us to try to get to bed a little earlier, we should also keep in mind that impaired brain function and motor skills will decrease the quality of our work. We won't be able to solve problems as quickly. And because we aren't thinking clearly, we might even exacerbate the very problems we're trying to fix. One study found that subjects who had been 17 hours or more without sleep experienced the same — if not worse — impairment while driving as those who were at the legal limit for blood-alcohol content. So when we work without sleep, it could have similar effects to working while inebriated.

Solutions

The real answer is quite simple: Devote seven or eight hours every night to sleep. It is best to try to keep the schedule consistent, as this will help our bodies keep what is called a circadian rhythm. Trying to sleep less during the week and then make up for it by oversleeping on the weekends will throw off that rhythm and make it much harder to wake up on Monday morning.

Caffeine

Stimulants such as caffeine will temporarily make us more alert and agile. They can't, however, be recommended as a real solution because they will wear off, leaving us in a state of withdrawal that is generally worse than before. Also, caffeine increases heart rate and blood pressure, which can compound other problems.

Power napping

One possible answer for those who simply cannot afford seven or eight hours of sleep every night is to take power naps. A power nap is a short period of sleep that ends just before entering deep sleep. Since the nap is so short, it is often possible to take one during a lunch break. A power nap is thought to give much of the same benefit of a regular sleep, but in only 20 to 30 minutes. Famous nappers include Winston Churchill, JFK, Ronald Reagan, Albert Einstein, Margaret Thatcher, Benjamin Franklin, and Leonardo Da Vinci.

When taking a power nap, it's important to keep the duration short. If you allow yourself to enter deep sleep and don't complete it, you'll experience what's called sleep inertia — basically morning grogginess — and may feel worse than before.

The bottom line is this: Whatever temporary fixes you may implement, in the end nothing can truly substitute for a good night's sleep.

Ergonomics tips for IT pros

It's relatively easy to find information about how to make the workplace more ergonomic for the typical computer user. But IT pros aren't typical, and creating an ergonomically friendly environment in the server room is a bit more challenging.

Ergonomics refers to the science of designing a workplace or other environment to minimize discomfort and fatigue and, by so doing, maximize productivity. The most high-profile ergonomics issue is probably that of repetitive stress injuries (RSIs). The most famous (or infamous) variety of RSI is carpal tunnel syndrome, although according to some medical experts, other types of RSI are actually more common in computer users.

However, there is much more to ergonomics than the avoidance of hand and arm pain. In this article, we'll look at some ways you can incorporate good ergonomic principles into the equipment you use and the way you perform the tasks of an IT pro, and thus avoid the associated health risks.

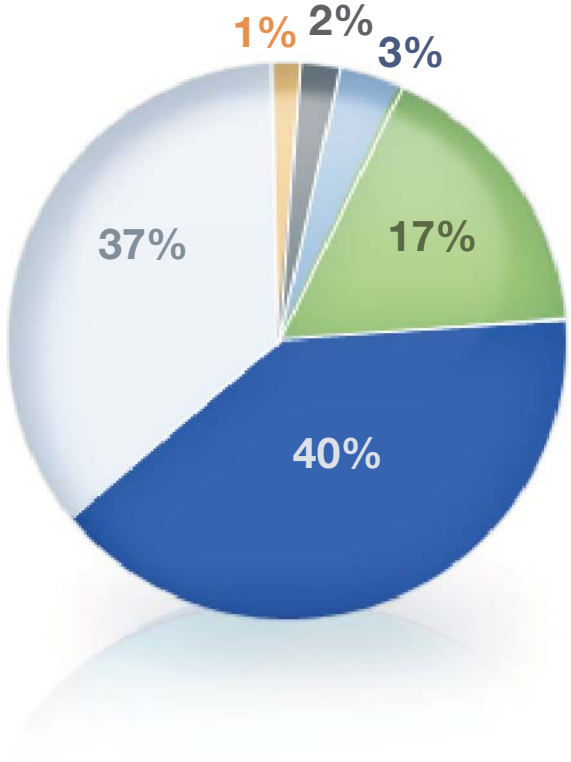
Are ergonomic keyboards necessary for the servers?

Unlike data entry workers, secretarial personnel, and some other users, an IT pro's job doesn't usually consist of continuously typing large amounts of text for hours on end. Thus, ergonomic keyboards may not be as essential in the server room as at the desks of those types of users. However, some people are more sensitive than others to arm/wrist/hand (or even neck) injuries from holding their hands in an unnatural position.

If you're one of those people and/or if you find yourself at the keyboard for long periods without a break, an ergo keyboard can save you a lot of grief. There are many types, ranging from the commonplace slightly contoured models, like the Microsoft Natural Elite, to specialized (and expensive) models that split completely into two or three adjustable parts. See examples at the Adaptive Technology for Information and Computing at MIT Web site.

The good news is that you probably don't need to buy multiple ergo keyboards for the server room. Multiple servers can share via a KVM switch. For a more modern solution, you can run multiple servers in VMs on one physical machine or use terminal services/remote desktop or other remote control software to access the desktops of multiple servers from your primary workstation.

Figure 2: How important do you think ergonomics are?



Source: TechRepublic's IT Health Survey
Check out all the results.

Sitting pretty: Three cheers for the right chair

"Chained to the chair" is an expression that many technology workers use to describe their work lives, and it may not be much of an exaggeration. Once upon a time, an IT administrator would be up and down all day, running from one server to another, checking out the router, visiting users' desks to configure their systems, and so on. But thanks to the aforementioned VM and remote control technologies, now you can do it all (or at least a lot of it) from one centralized location. That means you're likely to be sitting in that chair for long periods of time—and a bad fit can cause big health problems after a while.

Back pain is one of the most commonly reported health problems in adults, and it can be caused or exacerbated by the poor posture and contact stress that result from a chair that doesn't provide proper support. There is no one-size-fits-all chair, so one of the most important factors in choosing a chair is that it be easily adjustable as to seat height, armrests, forward/backward tilt, and height and depth of the lumbar support. For more information, see "Choosing the Right Ergonomic Office Chair."

Taking a stand

Even with a good chair, sitting all day isn't particularly healthy. Many adjustable computer carts can be adjusted so that you can work standing up. A lot of people with back problems find it more comfortable to stand, at least for part of the workday. Some find that a stand-up desk aids in concentration, too—especially during that afternoon lull, when it catches up with you that you stayed up until 3:00 A.M. the night before studying for your certification exam. (That was what you were doing, right?) You have more flexibility and mobility while standing, you can more easily do stretching exercises and move around a bit while working, and many sources say you burn more calories when standing than when sitting.

The ergonomics of sound

Another aspect of workplace comfort that's often overlooked is sound. Server rooms can be noisy places. If you're lucky, your office space is shut off from the actual server room, but if you're not, that constant noise can be stressful. Low-intensity white noise can cause fatigue and distraction, and some studies have shown that exposure can cause chronically elevated epinephrine levels that can be a risk factor for heart disease.

For more information about IT noise and ergonomics of sound, see "The Silent PC."

Getting around

Injuries often come about when we try to maneuver through overcrowded spaces, especially in an environment like the server room. If you don't have ample room around the systems to get to the backs and access ports, jacks, cables, power sources, etc., you'll have to contort your body into uncomfortable and possibly dangerous positions whenever you need to make changes to hardware or wiring. To avoid injuries, make sure that servers are properly mounted in racks that are capable of supporting the weight of all the systems mounted in them.

Eight cost-free steps to improve workstation ergonomics

As a support tech, part of your job is to proactively help maintain a healthy relationship between users and their computers—literally. Users need a comfortable workstation setup that isn't going to cause them any pain or physical wear and tear. Here are a few cost-free ideas for aiding your users' comfort.

- **Start looking at your users' feet when they're sitting at their desks.** Can they sit with their entire sole on the floor or footrest? If not, help them adjust their chair or find an old phone book or NetWare manual to rest their feet on.
- **Take a look at the arms.** The forearms should be parallel to the floor with the wrists and elbows in a neutral position or angled slightly down. It they aren't, the position can be corrected by adjusting the chair height or lowering/raising the keyboard tray.
- **Measure the distance from eyes to monitor.** Ideally, this should be in the 18- to 24-inch range. Moving the monitor on the desk and adjusting the position of the keyboard tray and chair are simple ways to achieve this. Sometimes changing the resolution of the display also helps, as people will lean toward their monitor if they have difficulty reading the text. Wearing reading glasses can also help some people.
- **Check the vertical position of the monitor.** The topmost line displayed on it should be at eye level. This position can be corrected by raising/lowering the chair or by standing the monitor on appropriate size books. My monitor is currently reposing on an ISO 9001 Universal Software binder.
- **Look at the area around the monitor and keyboard.** What's within a 16-inch radius? Constantly reaching for items can cause shoulder pain. Help your users rearrange their desks.
- **Observe mouse usage.** When mousing, the hand should be relaxed with the wrist in a neutral position and the mouse as close to the body as possible. White-knuckled death grips on the mouse are rarely necessary and tend to promote carpal tunnel syndrome, neck pain, and very unhappy mice.
- **Be wary of wrist rest usage.** It's generally not a good idea to support the wrists on anything while typing, especially on a nice squishy support. Wrist rests should be used only to rest between bouts of typing.
- **Advise your users to take frequent breaks from computing.** They should stand up, stretch, get coffee, do jumping jacks, water their plants, hunt for chocolate—anything different from sitting and staring at the computer—at least once an hour.

What IT pros should know about repetitive stress injuries

We've all heard about carpal tunnel syndrome and other repetitive stress injuries. Ergonomics is big business, and worker's comp claims for these types of injuries can cost companies big bucks. But what's the real story? In this article, we take a brief look at what you need to know about such injuries and how you can avoid them.

What is a repetitive stress injury?

The term repetitive stress injury (RSI) refers to a broad range of ailments that can result from long-term repetition of certain movements or actions. RSIs include:

Carpal tunnel syndrome (CTS)—Pain and numbness are caused by pressure on the median nerve in the wrist, usually because of swelling in the tendons due to excessive bending of the wrist, such as would occur with excessive typing, especially with poor form.

DeQuervain's syndrome—Pain is caused by inflammation of the tendons that control the movement of the thumb, often thought to be caused by the repeated hitting of the space bar while typing.

Bursitis—Pain and swelling are caused by inflammation of the bursa, which are basically sacs that serve as cushions for our joints.

There are many others, including tennis elbow and various forms of tendinitis. According to various statistics, RSIs cumulatively account for somewhere between one third and one half of all work-related injuries in the United States.

For computer users, the most famous of these disorders by far is carpal tunnel syndrome. But there is some debate in the medical community as to whether CTS is actually caused by computer activities, such as typing and mouse movement, or whether the injuries commonly resulting from those activities are actually some other disorder. From the perspective of the IT pro, however, it matters not at all what the injuries are called or how they are classified. What matters is that they are real, they can cost a business lots of money, and they are, for the most part, preventable.

Warning signs

RSIs are progressive injuries, meaning they get worse as you continue to strain the affected areas. Generally, the symptoms start off fairly mild, and if your activities are corrected early, they will fade away. So it's important to recognize when you are starting to develop an injury and take action to fix it. The main symptoms are:

- Recurring pain when typing or manipulating the mouse—mainly in the hands and wrists. Pain can also present in the forearms, shoulders, neck, or back.
- Numbness or tingling in the same areas.
- Weakness of grip and lack of endurance in the hands and wrists.

If you experience any or all of these symptoms, you should consult your physician immediately. As the injury worsens, it becomes much more difficult to treat.

Treatment

Once you've been diagnosed with an RSI, your physician may recommend a variety of treatment options:

Simple hand rest. The easiest solution may be to give the affected hand or area time to recover on its own, by not using it for a period of time. Depending on the severity of the symptoms, this could take anywhere from a couple of days to many weeks.

Physical therapy. Massages, stretches, and exercises can stimulate the affected nerve tissue.

Medication. Anti-inflammatory drugs can help with the swelling that originally caused the problems.

Braces or splints. An immobilizing brace can be worn to keep the wrists from moving and force safe technique while typing.

Surgery. With the most severe cases, surgery is often the best option. Studies show that after surgery, up to 90% of CTS sufferers are able to return to their jobs.

Prevention

Better than treatment, of course, is preventing any injury from occurring in the first place. Preventing an RSI in the workplace where heavy computer use occurs requires a combination of three factors: proper posture and typing technique, ergonomically designed equipment, and frequent breaks from hand activity.

Posture and technique

Posture plays an important role in where and how the stress from typing affects you. When you're sitting at the computer, your back should be straight and shoulders should be relaxed—don't lean back or slouch. Your thighs and forearms should be level, meaning that your elbows and knees will both be forming approximately right angles. If your desk or keyboard tray is too high for this positioning, use an adjustable height chair to bring yourself up to the right height.

Your monitor should come in at or somewhat below eye level to maintain proper neck alignment. If possible, keep the area at least a little warm, as cold muscles and tendons are most susceptible to injury. In cold offices where you have no control over the temperature, consider wearing fingerless gloves to keep your hands warm.

When typing, your hands should come in naturally straightforward from the wrists. Wrists shouldn't be bent back or to the side and should not be resting on anything. The palm/wrist rests on keyboards should be used only when taking a break from actually typing. When performing key combinations, such as those using Shift or Ctrl, you should use both hands instead of bending your fingers awkwardly to perform the combination in a single motion. Also, don't slam down keystrokes. Each key should be pressed with the minimum force necessary.

Ergonomic devices

In the last 10 to 15 years, much effort has been put into designing more ergonomic keyboards and pointing devices (not to mention desks, chairs, and nearly everything else you find at your workstation). Some keyboards are completely split in two pieces so you can position them however you like. Some are concave; some are convex. Indeed, they now come in so many shapes and sizes that many pages could be filled just describing them.

But when choosing your devices, it's most important to keep two things in mind. First, choose what is most comfortable to you. Second, choose what will help you maintain the proper posture and typing technique described above.

Take frequent breaks

Perhaps the most important of all the things you can do to prevent injury while working is to give your body enough time to rest. During any long session of typing, take many short breaks (rather than a couple of long ones). Every 5 to 10 minutes, take 30 seconds to a minute to rest and stretch your hands. During this break, walk away from the screen or close your eyes to alleviate eyestrain at the same time. Every hour or so, take three to five minutes to relax as well.

Cut back on computer use

If all preventative measures fail and you still find yourself developing an injury, remember what should be the most obvious answer: cut back. While the computer may be a vital aspect of your job, nearly everyone in the business has some measure of extraneous use they could live without, such as gaming or chatting. When you're engaged in those activities, remember that they aren't worth hurting yourself over.

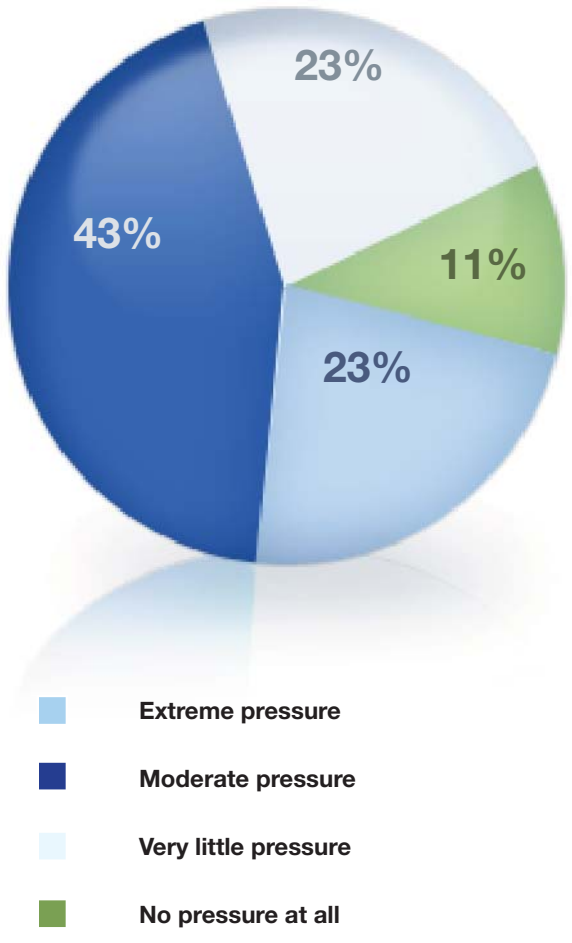
10 ways for techs to stay safe and healthy on the job

In an office environment, you'll typically find people struggling into work with colds and influenza, which they may pass along to co-workers—and to you. In fact, as a deskside tech person, you could easily become infected yourself and then pass the bug on to the next user you visit. Here are a few simple precautions that can help you stay healthy, along with some tips for avoiding other risks when performing support tech tasks.

#1: Wipe down equipment

Many people consider a cold insufficient reason to stay off work, so they come in when they're sick. Unfortunately, they're in close contact with their desktop PCs, germs and all. When they sneeze, the screen may get spattered, and their keyboard and mouse will be contaminated through hand contact. Add some antiseptic wipes to your toolkit and make sprucing up the desktop part of your care program.

Figure 3: How much pressure do you feel to go into work even when you're sick?



Source: TechRepublic's IT Health Survey
Check out all the results.

#2: Wash your hands between visits

When you have finished a job, wash your hands before you start the next one. Call in at the nearest washroom on your way to the next call and practice a clinical style of hand washing. Many infections are passed on by hand contact. Think about the last time you sneezed; did you cover your mouth with your hand? If you did and then went on to shake hands with somebody, you will have probably passed on any germs you might have. Washing your hands regularly will not only keep you from spreading germs, it will help protect you against those you may have picked up.

#3: Keep your germs at home

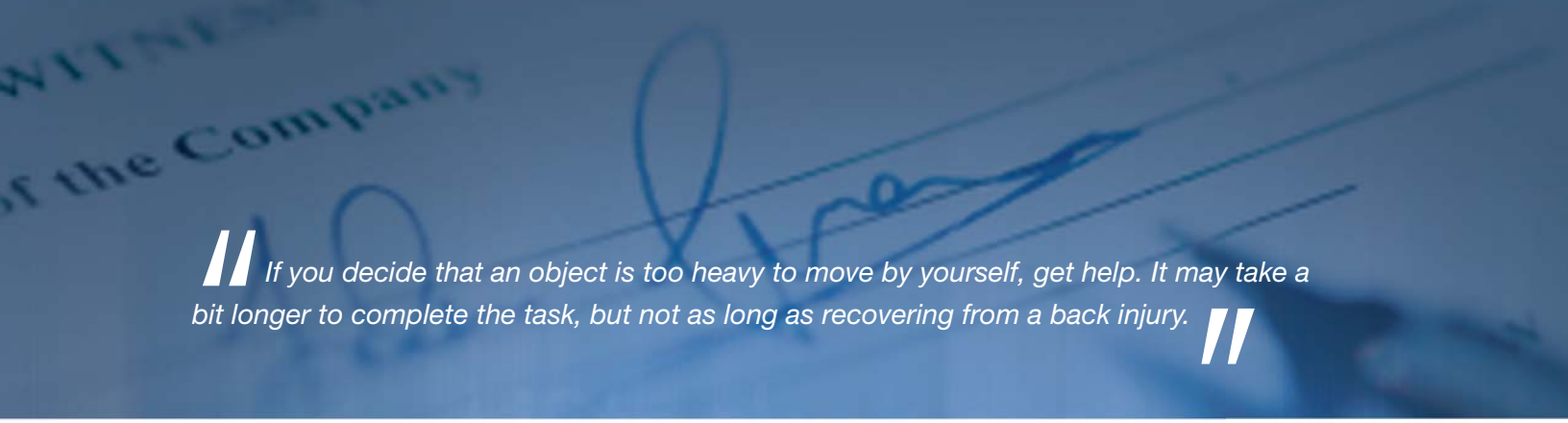
If you have a cold or influenza, consider staying off work. You may infect dozens of other people and you won't be performing at your best. Unfortunately, you may be at your most contagious before symptoms even show up. But it's still a good practice to stay home after your nose starts to stream and your eyes begin to itch.

#4: Don't skimp on vitamin C

Drink plenty of fresh fruit juice to keep your vitamin C levels high. Research suggests that vitamin C can help reduce the severity of symptoms and assist with recovery if you are infected.

#5: Don't run yourself down by overworking

Ensure that you have a life outside of work. A recent report in the UK stated that the biggest problem facing workers is an inability to maintain a healthy work/life balance. If you are tired, stressed, and run down, you are more susceptible to infection. Remember



> *If you decide that an object is too heavy to move by yourself, get help. It may take a bit longer to complete the task, but not as long as recovering from a back injury.*

that you work to live; if you are living to work you might want to reconsider your priorities.

#6: Take a break

If possible, get out of the office at lunchtime and take a walk in the fresh air. It is too easy to skip the meal break and carry on working, especially if there is a lot to get done. But the people you are helping don't expect to miss their breaks, and neither should you.

#7: Encourage clean habits

Make antiseptic screen wipes available to all workers and encourage them to clean their screens regularly. They should clean the base and back of the screen as well as the display, as dust can harbour bugs as well. This won't kill viruses, but it will help remove the kind of environment they thrive in.

#8: Beware of under-the-desk crud

If you have to crawl under desks, and most of us do from time to time, you will see some nasty and disturbing sights. If your desks have back panels and the usual spaghetti of cables, that will be a great place to trap dirt, dust, fluff bunnies, and even rotting food. Yet another good reason for visiting the washroom after finishing the job.

#9: Lift with care

Remember your basic load-handling skills when moving office equipment and furniture. There will be times when you will have to move desks, cabinets, and storage units to get to wall-mounted power outlets and network points. You might need to move things only half an inch to free a trapped cable, but those jerky movements can damage your back just as easily as a big lift. If you work in the UK and your job involves lifting, you can insist on specialist training on the best way to move heavy objects. If you decide that an object is too heavy to move by yourself, get help. It may take a bit longer to complete the task, but not as long as recovering from a back injury.

#10: Protect against electrical hazards

Finally, and most obviously, watch out for those electric shocks. When you open a case or take the back off an old style CRT monitor, a substantial amount of power is still stored in some pretty meaty capacitors. They can deal the unwary techie a substantial belt. There are special tools for discharging CRT tubes. If you don't have them and aren't properly trained, leave them alone.

The same applies to power supplies. Some of them have a fuse that can be replaced to get the machine humming again, but a quick fix is not worth getting a shock for. When I was training as a PC engineer, I was told that it can take 48 hours for the charge to dissipate from a tube. So whenever I took the a screen out to fix it, I labeled it with the time and date that power was disconnected. My practice was to install a spare and leave the defective one on the shelf for at least 72 hours before taking the back off. With the ever-lowering prices of these components, is it really worth risking electrocution when a replacement PSU can be fitted for just a few pounds?

Self-defense tips for techies

As an IT pro, your focus is on protecting your network, not yourself. But given the nature of the job, you could be at risk too—especially if you often work late, after everyone else has gone home. You might end up walking across a dark parking lot at 2:00 A.M., sleep-deprived, dead tired, and lost in thought. That can make you a prime target for criminals looking for victims.

Here are a few precautions that can greatly improve your odds of staying safe. For a detailed look at strategies for protecting yourself, see "Stay safe when you pull an all-nighter: 10 self-defense tips for techies."

#1: Pay attention. The most important step in defending yourself against potential muggers and other criminals is to develop the proper mental state of awareness. That means constantly assessing your surroundings, especially when you're in an environment where risk is high (e.g., working or walking alone late at night).

#2: Have a plan. Once you've learned to be aware of your surroundings and recognize early that something is wrong, you need a plan for what you'll do if you're attacked or otherwise placed in danger. Evaluate where the danger is most likely to come from and decide beforehand how you'll react if a particular threat becomes reality.

Having a plan also means planning ahead. Park your car in a lighted area, if possible, when you're likely to be returning to it after dark. Have your keys out and ready before you even leave the building, so you don't have to fumble for them on your way to the vehicle.

#3: Stay physically fit. Attackers usually prefer victims over whom they have a physical advantage. Some disadvantages you may not be able to do anything about: If you're disabled, elderly, or very small, it will be easier for a criminal to overpower you. Even in those situations, though, staying as physically fit as you can under the circumstances will help you survive a physical confrontation, if it comes to that, with less injury. In addition, when you're fit and aware, you tend to project an aura of self-confidence that will help deter predators—who, like their animal counterparts, prey on the weak.

#4: Take common sense precautions. Remember the old adage: An ounce of prevention is worth a pound of cure. Lock your office or server room door when you're working late alone. Don't let anyone in whom you don't know (social engineering can be used by attackers to gain physical entry just as it's used by hackers to gain network access). If there's a security guard, get to know him/her. Don't be afraid to ask for an escort to your car when you leave the building.

If someone follows your car, don't go home. Drive to a police station or a place where there are plenty of people. Also use common sense to avoid making yourself an attractive target. Don't wear conspicuous

expensive jewelry or flash money, don't hitchhike or accept rides from strangers, and so forth.

#5: Be prepared to make noise—lots of it. In addition to other defensive measures, be sure that you have the capability of making a loud noise to draw attention to your plight. Whether you carry a police whistle on a chain around your neck, a 120 decibel "personal alarm" device clipped to your belt, or you just learn to scream really loudly (don't just assume you can—practice it until you can let out a piercing scream at the top of your lungs), have some way to "get loud."

#6: Take a class. Self-defense classes can serve two purposes. First, they provide you with knowledge—such as what the most vulnerable areas on the body are so you know what to target with your improvised weapon, how to use an attacker's own momentum to throw him to the ground when he comes at you, or your state's weapons and use of force laws. But perhaps even more important, they build confidence. When you've not just read or heard about these techniques but actually practiced them repeatedly, you don't have to stop and think before putting them into action.

Knowledge is power, and self defense is based on knowledge. But effective self defense also relies on physical skills that must be developed through practice. If you plan to rely on moves or techniques, take the time to burn those moves into muscle memory through repetitive practice.

Credits

Debra Littlejohn Shinder is a technology consultant, trainer, and writer who has authored a number of books on computer operating systems, networking, and security. These include Scene of the Cybercrime: Computer Forensics Handbook*, published by Syngress, and* Computer Networking Essentials*, published by Cisco Press. She is editor of WXPnews and VistaNews and for the past five years has been awarded the Microsoft MVP in enterprise security.*

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