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## Repetitive Stress Injuries

Michael started running track freshman year, gradually working up to longer and longer distances. Now a senior, he recently took up trail running and dreams of running the Marine Corps Marathon someday.

Michael's love for his chosen sport made it really hard when he started having some shin pain during his sophomore year. His doctor told him to take a break from running for 6 weeks because he had developed a stress fracture. But after a few weeks of rest, Michael went back to running as if nothing had happened and he hasn't had any problems since.

### What Are Repetitive Stress Injuries?

Repetitive stress injuries (RSIs) are injuries that happen when too much stress is placed on a part of the body, resulting in inflammation (pain and swelling), muscle strain, or tissue damage. This stress generally occurs from repeating the same movements over and over again.

RSIs are common work-related injuries, often affecting people who spend a lot of time using computer keyboards.

While most common in adults, RSIs are becoming more prevalent in teens because they spend more time than ever using computers. Playing sports like tennis that involve repetitive motions can also lead to RSIs. You may hear sports-related RSIs referred to as **overuse injuries**. Teens who spend a lot of time playing musical instruments or video games are also at risk for RSIs.

In general, RSIs include more than 100 different kinds of injuries and illnesses resulting from repetitive wear and tear on the body. These injuries vary from person to person in type and severity.

In teens, overuse injuries most often occur at **growth plates** (areas at the ends of bones where bone cells multiply rapidly, making bones longer as someone grows). Areas most affected by RSIs are the elbows, shoulders, knees, and heels.

### What Causes Repetitive Stress Injuries?

Most RSI conditions found in teens are linked to the stress of repetitive motions at the computer or in sports. When stress occurs repeatedly over time, the body's joints don't have the chance to recover, and the joints and surrounding tendons and muscles become irritated and inflamed.

Certain jobs that involve repetitive tasks — such as scanning items as a supermarket checker or carrying heavy trays as a waiter — can lead to RSIs. Sometimes, playing musical instruments can cause problems from overuse of certain hand or arm movements. Any repetitive movement can cause an injury — even text messaging!

Using improper equipment while playing sports is another important factor in RSIs. For example, running in athletic shoes that don't provide enough support can lead to shin splits and foot and ankle problems. Improperly fitted tennis rackets can contribute to a condition called tennis elbow.

Teens may be susceptible to RSIs because of the significant physical growth that occurs in the teen years. The growth spurt (the rapid growth period during puberty) can create extra tightness and tension in muscles and tendons, making teens more prone to injury.

Nutritional factors also come into play in RSIs. Proper nutrition is essential for developing and maintaining strong muscles and bones — and to keep up the energy levels needed to play sports and perform other physical activities well.

### What Happens When Teens Have RSIs?

Symptoms of RSIs include:

- tingling, numbness, or pain in the affected area
- stiffness or soreness in the neck or back
- feelings of weakness or fatigue in the hands or arms
- popping or clicking sensation

If you notice any of these warning signs of RSIs, make an appointment to see a doctor. Even if your symptoms seem to come and go, don't ignore them or they may lead to more serious problems.

Without treatment, RSIs can become more severe and prevent you from doing simple everyday tasks and participating in sports, music, and other favorite activities.

## What Kinds of Repetitive Stress Injuries Can Teens Get?

RSIs that can develop in teens include:

**Bursitis.** Inflammation of a bursa, which is a fluid-filled sac that acts as a cushion for a joint, is known as bursitis (pronounced: bur-SYE-tis). Signs of bursitis include pain and swelling. It is associated with frequent overhead reaching, carrying overloaded backpacks, and overusing certain joints during sports, such as the knee or shoulder.

**Carpal tunnel syndrome.** In carpal tunnel syndrome, swelling occurs inside a narrow "tunnel" formed by bone and ligament in the wrist. This tunnel surrounds nerves that conduct sensory and motor impulses to and from the hand, causing pain, tingling, numbness, and weakness. Carpal tunnel syndrome is caused by repeated motion that can happen during activities like typing or playing video games (using joysticks). It's rare in teens and more common in adults, especially those in computer-related jobs.

**Epicondylitis.** This condition is characterized by pain and swelling at the point where the bones join at the elbow. Epicondylitis (pronounced: eh-pih-kon-dih-LYE-tis) is nicknamed "tennis elbow" because it frequently occurs in tennis players.

**Osgood-Schlatter disease.** This is a common cause of knee pain in teens, especially teen athletes who are undergoing a growth spurt. Frequent use and physical stress (such as running long distances) can cause inflammation at the area where the tendon from the kneecap attaches to the shinbone.

**Patellofemoral syndrome.** This is a softening or breaking down of kneecap cartilage. Squatting, kneeling, and climbing stairs and hills can aggravate pain around the knee.

**Shin splints.** This term refers to pain along the shin or front of the lower leg. Shin splints are commonly found in runners and are usually harmless, although they can be quite painful. They can be difficult to tell apart from stress fractures.

**Stress fractures.** Stress fractures are tiny cracks in the bone's surface caused by rhythmic, repetitive overloading. These injuries can occur when a bone comes under repeated stress from running, marching, walking, or jumping, or from stress on the body like when a person changes running surfaces or runs in worn-out sneakers.

**Tendonitis.** In tendonitis, tearing and inflammation occur in the tendons, rope-like bands of tissue that connect muscles to bones. Tendonitis is associated with repetitive overstretching of tendons from overuse of certain muscles.

## Preventing RSIs

### Preventing Computer-Related Injuries

To prevent injuries from computer use, make sure your computer equipment and furniture fit you properly and that you use correct typing and sitting positions. If your parents are shopping for new computer furniture, suggest that they buy pieces that can be adjusted for each family member.

Here are some tips:

- Make sure the top of your computer screen is aligned with your forehead.
- Sit up straight with your back touching the back of your seat. Chairs that provide extra support, especially lumbar (lower back) support are helpful. Avoid slouching over your keyboard or tensing your shoulders, which can place unnecessary stress on your neck, back, and spine.
- Let your legs rest comfortably with your feet flat on the floor or on a footrest. (To test whether your legs are in a good position, try placing a pencil on your knee — the pencil should roll toward your waist, not off of your knee.)
- Use a light touch when typing. Place the keyboard close to you so that you don't have to reach for it.
- Fingers and wrists should remain level while typing. Try a wrist rest for extra support. Your wrists and forearms should be at a 90-degree angle to the upper part of your arms. Elbows should be placed close to the side of the body to prevent bending the wrists side to side.
- It's easy to lose track of time when you're surfing the Internet or immersed in a homework assignment. Be sure to take breaks (to stretch or walk around) about every 30 minutes — even if you don't feel tired or feel any pain. (If you lose track of time, use a timer so you know when you're due for a break.)

- Try an ergonomic ("ergonomic" means specially designed for comfort) keyboard that has a curved design, and use a trackball instead of a mouse.

### **Preventing Sports-Related Injuries**

Begin any sports season with a full physical exam from your doctor so that any problems or concerns can be addressed before you begin workouts and competitions. More tips:

- Always warm up and cool down with appropriate stretching exercises before and after playing.
- Wear the proper clothing and equipment for your sport. For example, tennis players should be fitted for rackets that allow for a good grip on the handle. Wear appropriate safety gear for your sport, such as kneepads and wrist supports.
- Drink plenty of water before, during, and after your workouts. Listen to your body and rest when you feel tired.
- Vary your day-to-day activities. Alternate distance running with bicycling or swimming, for example.
- If you are experiencing symptoms such as pain, swelling, numbness, or stiffness while playing your sport, stop playing right away and see your doctor as soon as possible.

### **What Do Doctors Do?**

The sooner an RSI is diagnosed, the sooner your body can heal, so be sure to see your doctor if you have symptoms.

The doctor will try to assess how the injury occurred and what motions cause pain. Your doctor may perform X-rays, blood tests, or other tests to make sure there are no other health problems. In addition to doing a physical examination, the doctor may ask you about any concerns and symptoms you have, your past health, your family's health, any medications you're taking, any allergies you may have, and other issues. This is called the **medical history**.

If you are diagnosed with an RSI, resting the affected area is the key to getting better. Your doctor may recommend that you take anti-inflammatory medication (such as ibuprofen) for a period of time. Ice packs are sometimes recommended to reduce pain and swelling.

After the swelling and pain have gone away, your doctor may suggest a rehabilitation program with a physical therapist to exercise your muscles and prevent loss of joint movement.

### **Taking Care of Yourself**

Prevention is the best medicine when it comes to RSIs. Overall flexibility and strength can help to prevent RSIs, so exercise regularly and stay active (remembering warm-ups, cool-downs, and stretching, of course!).

To avoid overusing muscles and joints, be sensible about the amount of time you spend doing any repeated motions. If an activity is repetitive, take breaks and do something different every 30 minutes or so.

**Reviewed by:** Mary L. Gavin, MD

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