Hughston Health Alert

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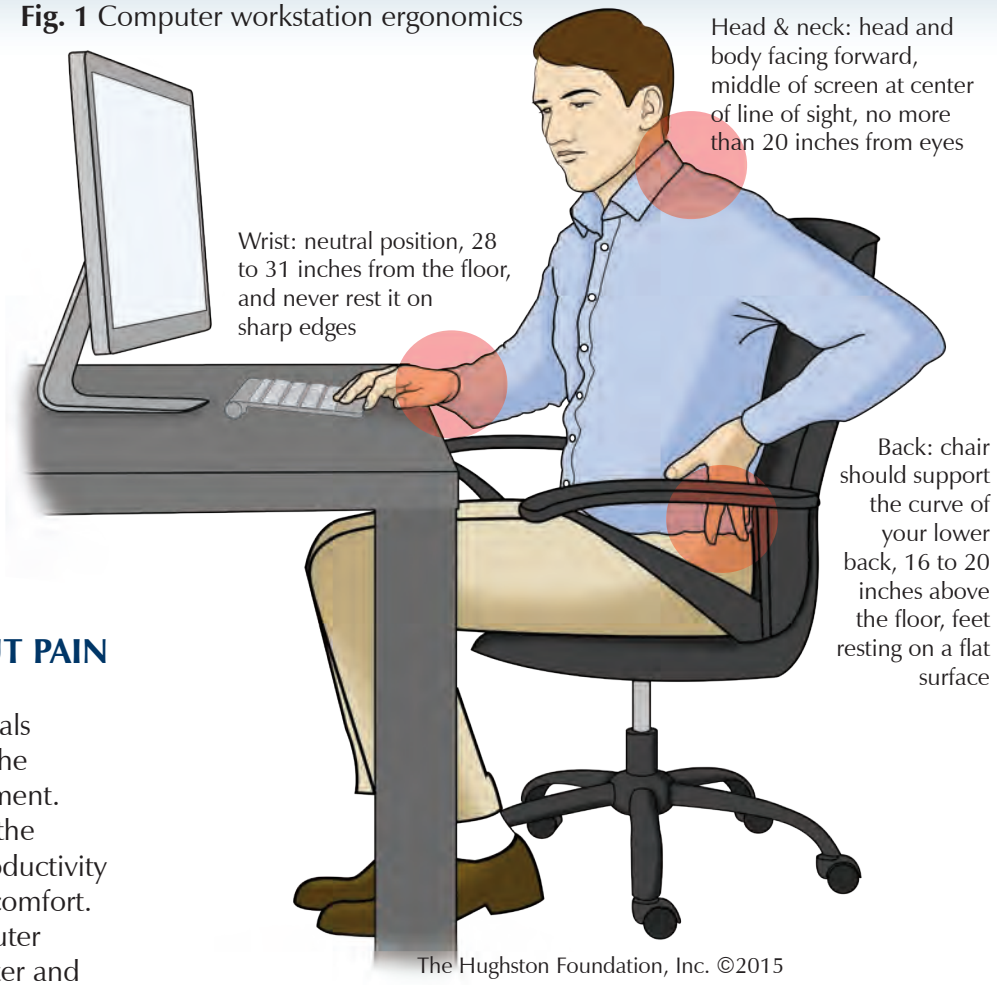
Fig. 1 Computer workstation ergonomics



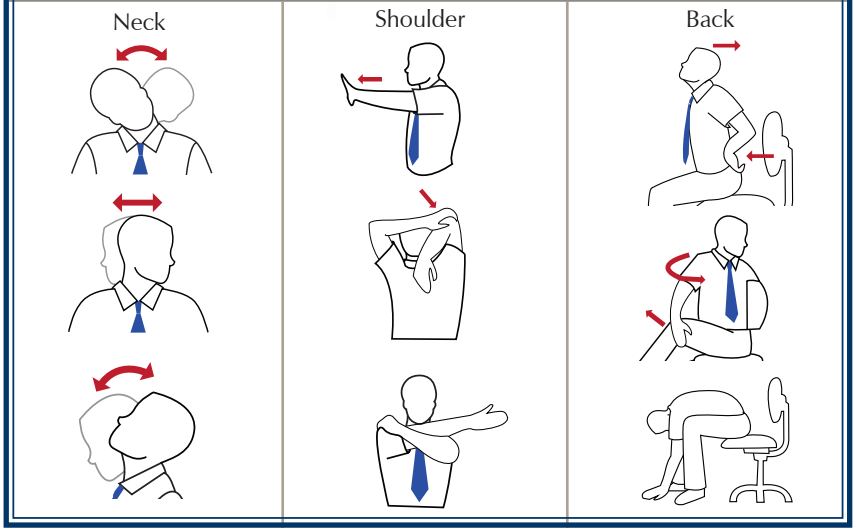
Computer Ergonomics

WORKING EFFECTIVELY WITHOUT PAIN

Ergonomics is an applied science that deals with the interaction between people and the equipment they use in their work environment. Ergonomists look at the physical design of the workplace with the goal of maximizing productivity while minimizing operator fatigue and discomfort. A subspecialty of ergonomics called computer ergonomics helps people use their computer and workstation without pain or fatigue, even after hours of sitting, typing, and looking at a monitor. If you experience pain or fatigue after using your computer, you may want to evaluate your work area and make some adjustments to help you feel better and be more productive.

What kinds of pain can develop from working in a space that is not ergonomically efficient? Long hours hunched over a computer can lead to back pain in some people. Neck pain or stiffness can also result from staring at a computer screen for long periods of time. Additionally, carpal tunnel syndrome can develop in the wrists from repetitive hand movements such as moving the mouse. Consider the type of pain you are having and where it is located when you rearrange your workstation.

Fig. 2 Workstation stretching examples



Solutions

Use the measurements and guidelines in the following sections to transform your work area to make it comfortable for you. Make changes slowly to avoid going from one faulty set up to another. When making adjustments, be sure that you leave enough space so you can change positions, move around, and take short breaks to stretch your muscles. Keep in mind that every situation and person is different; therefore, what works for someone else may not work for you.

What could be causing your pain?
Continuous pressure on the wrist from the wrist rest, work surface, or armrest
The keyboard is too high or too low, causing the wrist to remain in a bent position
The mouse is too far away or too high or low
The monitor is not positioned in front of you or at eye level
The chair seat and armrests are too high or too low for your body
Your feet are not flat on the floor
Your knees are higher than your hips when your feet are on the floor
Lack of leg room or clearance under the desk
Leaning forward or to the side when reaching for items
Reaching, especially overhead, too often

Keyboard, mouse, and work surface

Deviating from a neutral wrist position for hours at a time can contribute to hand and wrist fatigue. The wrist is in a neutral position during a handshake; to help maintain that position, set the height of your keyboard 28 to 31 inches from the floor and position your mouse next to the keyboard at this same level. The top row of keys should never be more than 10 inches from the front edge of your work surface. Additionally, never allow your wrists to come into contact with sharp edges; a padded wrist rest can help protect them. Relax and use the least amount of pressure possible on your keyboard and mouse. Overall, your work surface should allow 25 to 27 inches of clearance for your legs.

Computer screen

Avoid positioning yourself so you have to turn to see your screen. Place the middle of your screen directly in the center of your line of sight with your entire body facing in the same direction. For ideal desktop monitor placement, set the middle of the computer screen 37 to 43 inches above the floor and distance the screen no more than 20 inches from your eyes.

Chair

Your chair should be fully adjustable and support the curve of your lower back. If the chair has armrests, position them so you do not slouch while using them. The chair seat should be 16 to 20 inches above the floor, at least 18 inches wide, and 15 to 17 inches deep. The 4-inch range in height should accommodate most people. In addition, the chair must not slope downward more than 10° from the horizontal starting position and you should be able to lean back in the chair no more than 15° from the vertical starting point. Use a footrest or stool so your feet rest comfortably on a flat surface. Keep your thighs horizontal or sloped slightly downward, making your hips slightly higher than your knees when you are seated in the chair.

Organizing the work space

Overreaching in any direction can cause fatigue and reduce productivity, so keep your work and essential items close to you. For example, if you use your computer and telephone most of the day, your keyboard, mouse, and phone should be within easy reach while sitting with your elbows at your sides. Files and reference material used occasionally, such as to look up a number or check spelling, can be set an arm's length away.

Microbreaks to help relieve your pain

If you work at a computer more than about 60% of the workday, you should take frequent rest periods to break up the long hours of performing repetitive movements. Stand up and move every hour to put weight on your feet to improve circulation and reduce muscle fatigue. Additionally, take a break about every 20 to 30 minutes to stretch. Use smooth, gentle motions while stretching. Once you feel a stretching sensation, hold the position for about 10 seconds to get the full benefit. If you experience pain with any stretch, discontinue that stretch until you can perform it comfortably or have consulted your physician. For optimal results, repeat each stretch 15 times.

Getting help

Leaving work tired and in pain does not have to be a part of your life. You can follow the techniques that professional ergonomists use to make your workstation accommodate your body and your daily work routine. If, after some effort, you are unable to create a pain-free work environment for yourself, contact an ergonomist who can help you evaluate your situation. You can find a certified ergonomist in your area by searching the online directory of the Board of Certification in Professional Ergonomics at www.bcpe.org or calling (888) 856-4685. You will be surprised how making a few simple changes to your workstation and the way you move can alleviate your pain.

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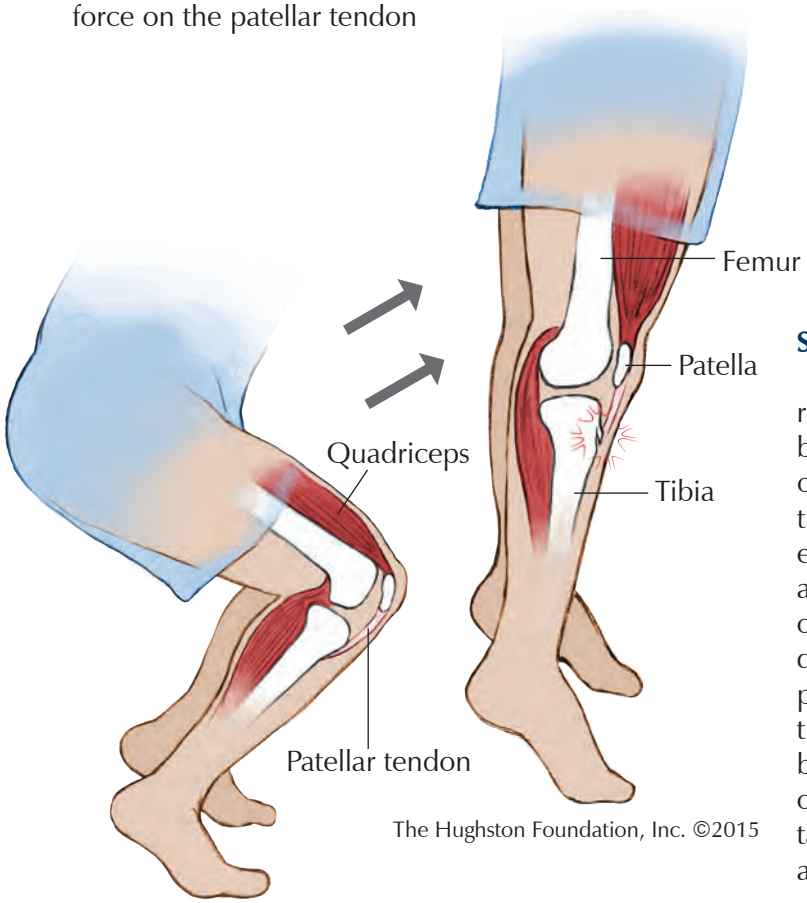
Tibial Tubercle Fracture

AN UNUSUAL FRACTURE

A tibial tubercle fracture, or tibial tubercle avulsion fracture, is a rare injury that typically results from a direct, sudden force on the upper front portion of the lower leg. The tibial tubercle or tuberosity is recognizable as the bump or bony protrusion on the front or anterior of the tibia (shinbone) just below the knee. It is part of the mechanism of the joint that extends or straightens the leg; it is also where the quadriceps muscle of the front of the thigh and the patellar tendon that connects the patella (kneecap) to the tibia attach. If the tibial tubercle is fractured, the patellar tendon—or more accurately, patellar ligament, as it connects bone to bone rather than muscle to bone—loses its attachment site, resulting in an avulsion or a tearing away of the tendon tissue. The patient will then be unable to straighten his or her knee or to hold it in a position of extension, which is essential for walking. In adolescents, this kind of fracture generally occurs at the epiphyseal or growth plate (the soft area at the end of an immature bone where growth occurs) of the proximal tibia or area just below the kneecap. Since the growth plate is inherently weaker than the rest of the bone, the same trauma that causes a patellar tendon rupture (a tearing of the ligament that holds the kneecap in place) in an adult will likely cause a tibial tubercle fracture in an adolescent.

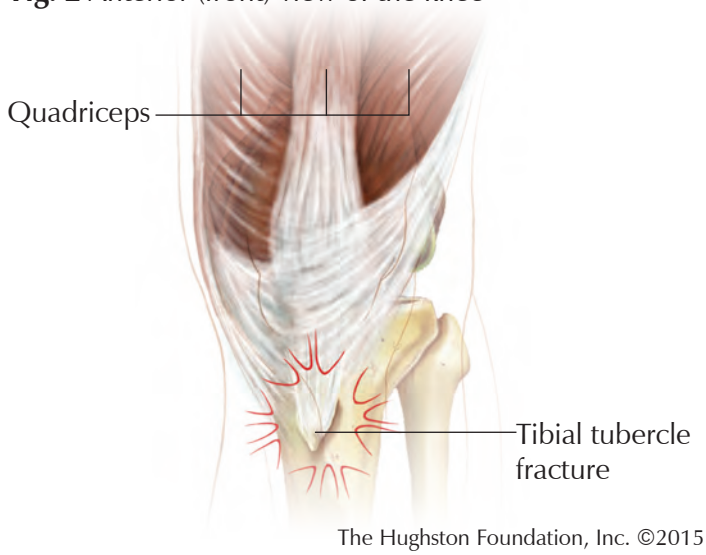
Fig. 1 Tibial tubercle fracture resulting from exerted force on the patellar tendon



Causes

Tibial tubercle fractures result from violent, tensile forces acting on the tibial tuberosity. Such forces may entail either the sudden contraction of the quadriceps muscle that extends the knee without shortening (as you spring off when jumping) or the forceful flexion of the knee against the contraction of the quadriceps muscle at the front of the thigh (as when you land from a jump). Consequently, individuals who participate in sports that require jumping—basketball, for instance—or contact sports, such as soccer and football, are at increased risk for a tibial tubercle fracture. Being overweight or having poor knee strength and flexibility also increases the risk for this injury which is more common in males than females. Additionally, those suffering from Osgood-Schlatter disease—an inflammation of the patellar ligament at the site of the tibial tuberosity (also known as apophysitis of the tibial tubercle) and characterized by a painful lump just below the knee—may be predisposed to tibial tubercle fractures.

Fig. 2 Anterior (front) view of the knee



Symptoms and diagnosis

Patients who sustain tibial tubercle fractures usually report hearing a pop or crack at the front of the shinbone below the knee, followed by pain and the inability to stand or walk. Next, swelling and bruising quickly develop. Since the patient is usually in considerable pain, any physical examination is limited, but by palpating the patellar tendon and tibial tubercle, a practitioner can pinpoint the area of greatest discomfort. Additionally, it is important to distinguish between a tibial tubercle fracture and a patellar tendon rupture. In the case of a tendon rupture, the kneecap moves up the thigh leaving a palpable hole between the ends of the ruptured tendon on the front of the knee. The pain will usually preclude x-rays, but if taken, the results will reveal the tibial tubercle to be in an abnormal position.

Treatment

If you sustain a tibial tubercle fracture, the application of ice and nonsteroidal anti-inflammatory drugs (NSAIDs), including aspirin and ibuprofen, can be used to relieve the initial pain and swelling. If necessary, your doctor can prescribe stronger pain relievers. Further treatment will depend on your individual circumstances. If the tibial tubercle fracture is not displaced from the normal position, treatment will be conservative—namely, immobilization in a long cast with full knee extension. If the fracture is displaced, then the treatment will be more radical, consisting of surgery, open reduction, and internal fixation. During surgery, an open incision is made over the front of the knee at the level of the fracture. Your surgeon will then cleanse the injury site of debris and any possible hematoma (a solid swelling of clotted blood within the tissue) and reassemble the fracture fragments, inserting screws to hold these in place. After surgery, your limb will be placed in an immobilizing cast for 6 to 8 weeks. During rehabilitation, you will need exercises to regain strength in the quadriceps muscle and to recover the full range of motion of the knee. Your rehabilitation may be done either at home or in clinic with a therapist. Unless pain or other problems arise, the hardware placed in the joint during surgery is not ordinarily removed. After proper treatment and rehabilitation, you should be able to return to your previous level of activity, whether this was low or high intensity.

Prevention

There are a number of preventive measures active individuals can take to help avoid a tibial tubercle fracture. For example, as weight is a risk factor that can be controlled, if you are overweight, talk to your doctor about losing some weight. Before engaging in sports and other activities, be sure to warm up properly. Include exercises in your daily regime to strengthen your lower body and enhance its flexibility. Exercises that strengthen the quadriceps muscle, such as squats or leg-lifts, are especially recommended. Learning and applying the proper exercise technique for your sport is also essential for avoiding tibial tubercle fractures and minimizing the risk of any injury. Lastly, developing and maintaining all-around good cardiovascular fitness and flexibility are always beneficial.

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Eating Disorders

According to the National Association of Anorexia Nervosa and Associated Disorders, up to 24 million people in the United States, including all genders and ages, currently suffer from some type of eating disorder. Anorexia nervosa, bulimia nervosa, and binge eating are the most common types of eating disorders. Eating disorders are much more prevalent in females than in males; only 1 in 10 of all cases of eating disorders involve men, and only 5% to 15% of anorexics or bulimics are male. Moreover, males are less likely than females to seek treatment for an eating disorder and so less likely to be diagnosed early. People with eating disorders typically have coexisting psychological issues. In fact, it is estimated that 50% of individuals who suffer from eating disorders also meet the criteria for depression, and of all mental illnesses, eating disorders have the highest mortality rate. Overall, anorexics have a 4% mortality rate and bulimics a 3% to 9% rate. Usually, patients with disordered eating die from the health complications—such as heart failure, organ failure, and malnutrition—that arise as a result of their disorder.

Anorexia nervosa

Anorexia nervosa is a serious, life-threatening eating disorder. Individuals who suffer from anorexia have a distorted body image or what is known as body dysmorphic disorder; they tend to see themselves as being overweight even when they are considerably underweight and malnourished. Anorexics are characterized by a relentless desire to be thin; they are unwilling to maintain a healthy weight due to an exaggerated fear of gaining weight coupled with a deeply disturbed relationship with food. Some people with anorexia lose weight by dieting and exercising excessively, others by self-induced vomiting or abusing laxatives, diuretics, or enemas. The most significant common factor among anorexics is an extremely low and, consequently, unhealthy body weight. The signs and symptoms of the condition include deliberate self-starvation accompanied by weight loss, an intense and persistent fear of gaining weight, either highly restrictive eating or refusal to eat altogether, constant dieting, excessive facial or body hair or hair loss (due to inadequate protein in the diet), compulsive exercise, sensitivity to cold, and absent or irregular menstruation.

Bulimia nervosa

Bulimia nervosa is a type of eating disorder in which an individual loses control and consumes vast quantities of food at one time (binge eating). The term bulimia comes from ancient Greek and means “ox hunger.” Bulimics binge on food and, feeling guilty about it afterward, try to compensate by purging (vomiting or taking diuretics and laxatives in excessive amounts), fasting, or exercising excessively. Like people with anorexia, bulimics are extremely dissatisfied with their body size and shape; they become obsessed with their weight, fearing weight gain and wanting desperately to lose weight. Unlike anorexics, however, people with bulimia often are at a normal weight relative to their height, though they may also undergo dramatic shifts in weight. The signs and symptoms of bulimia include a preoccupation with food, binge eating (usually done in secret), vomiting after

binging, abuse of laxatives along with diuretics and diet pills, denial of hunger, consumption of drugs to induce vomiting, and compulsive exercise. People suffering from bulimia often have swollen salivary glands and broken blood vessels in their eyes. In addition, bulimics frequently have problems with their gastrointestinal tract and with their teeth because vomiting exposes these structures to the corrosive effects of stomach acid.

Binge-eating disorder

Binge-eating—which has only been classified as an official eating disorder with the current edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*—is the consumption of vast quantities of food in a single sitting without purging, fasting, or excessive exercise. This often leads to weight gain or even obesity. People who suffer from binge eating feel they cannot control their eating and are not satisfied until every bit of food around them has been consumed. The signs and symptoms of binge-eating disorder include: loss of control over the amount of food consumed, marked distress over a binge episode, binging at a rate of at least once per week for 3 months, eating more rapidly than is normal, eating until feeling uncomfortably full, eating large quantities of food when not hungry, eating alone due to embarrassment about the quantities consumed, and feeling disgusted with oneself, depressed, or even guilty after overeating. Bingers tend to establish a cycle that they repeat several times a week.

Athletes and eating disorders

Eating disorders are more common in athletes than the general population. Elite athletes in particular are at risk; studies have revealed the rate of eating disorders in elite athletes to be 20% compared to 9% in the general population. Athletes in sports that rely on judging or are aesthetic in nature, such as gymnastics, figure skating, ballet, synchronized swimming, and diving, are at the highest risk along with those in sports where weight is a factor, such as running and jumping. Male athletes at the highest risk for eating disorders are jockeys and wrestlers along with those participating in sports that require running or jumping. In addition, athletes may be susceptible to other aspects of disordered eating behavior as often the line between dedication to training and compulsive exercise and between watching what one eats and obsessive dieting is easily blurred. Athletes with eating disorders tend to suffer from perfectionism, compulsiveness, a tendency toward depression, and body dysmorphic disorder as well as a general pre-occupation with dieting and weight. Furthermore, the culture surrounding many sports tends to focus on appearance and the body type considered optimal for performance.

A number of high-profile American athletes, such as Olympic multi-medal-winning swimmer Dara Torres and 1994 Olympic silver medal figure skater Nancy Kerrigan, admit to having suffered from eating disorders at some point in their careers. In 1994, US gymnast and world competitor Christy Heinrich died at age 22 of multiple organ failure after years of battling anorexia; she weighed just 47 lbs. International and male athletes are not immune: the career of Swiss ski-jumper and multi-World Cup champion Stefan Zund was cut short in the late 1990s by an eating disorder.

Athletes must beware of the serious medical conditions that may arise from eating disorders, including electrolyte imbalances, cardiac arrhythmia, osteoporosis, severe dehydration, muscle weakness, and kidney failure. These conditions can result in chronic health problems and even death. According to Cheryl Hug-English, Medical Director of the Student Health Center at the University of Nevada at Reno, coaches can help by being less performance-oriented and more person-oriented in their coaching style and, as a whole, de-emphasizing weight and body shape with respect to performance. Additionally, it is important that all athletic staff be educated about eating disorders.

Getting help

If you have an eating disorder, several levels of treatment are available to you, depending upon the resources in your area, including weekly support groups, outpatient treatment with a therapist, consultation with a psychiatrist, sessions with a dietitian or nutritionist, partial hospitalization, and finally, inpatient or residential treatment. Psychiatric treatment may include taking a selective serotonin reuptake inhibitor (SSRI) for depression. Recovering from an eating disorder can be difficult; relapses are common, but with the support of a mental health professional and nutritionist, it is definitely possible. If you or someone you know is suffering from an eating disorder, the National Association of Anorexia Nervosa and Associated Disorders offers information for getting help. The website to visit is http://www.anad.org/get-help.

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Driving After Orthopaedic Surgery

For most people, driving is an essential part of everyday life, making even the temporary inability to drive a major inconvenience. After orthopaedic surgery, whether on an upper extremity—such as the hand, wrist, elbow, arm, or shoulder—or lower extremity—such as the hip, knee, ankle, or foot—patients may be tempted to drive prematurely in order to get to follow-up medical appointments, see their physical therapist, or to commute to work. Although the type and location of the surgical procedure, the presence of postoperative pain, and the immobilization of a limb can all affect a patient's ability to operate a vehicle, no specific guidelines about when it is safe to resume driving have been established. To complicate matters further, legal implications have made insurance companies reluctant to determine fitness to drive. Moreover, law enforcement agencies determine driver impairment on a case by case basis while physicians may be unwilling to clear a patient to drive for fear of becoming liable for injuries should an accident occur. Thus in the absence of any clear directives, the responsibility for determining readiness to drive falls onto the patient's shoulders.

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Nevertheless, there are some general guidelines: you should be off narcotic pain medications and no longer immobilized in a splint or cast; additionally, you should feel comfortable driving and be able to push the brake pedal quickly and without pain. While a patient with any form of immobilization of an upper extremity should be restricted from driving, recommendations for patients returning to driving after surgery on one of the lower extremities vary depending on the type of surgery—such as hip or knee replacement, knee arthroscopy, ankle fusion, or bunion surgery—and which leg is involved.[1] In general, the patient should be able to place his or her full weight on the affected leg and to walk without an aid or crutch. It should be noted that studies on driving after surgery on a lower extremity are based on driving automatic transmission vehicles and using the right foot for both the accelerator and brake.[2]

Controlling your vehicle

In order to drive safely, you must be able to control your vehicle at all times. This means you should have full range of motion in your neck and torso so that you can turn to check mirrors and look out windows to watch for pedestrians and other drivers. Furthermore, you must be able to reach the controls on the dashboard easily, push the brake pedal comfortably, and make a sudden stop if necessary. If you cannot maneuver and stop the vehicle because you are in pain, taking medication, or wearing an orthosis (a device that provides control, correction, and support of a limb), then you are not ready to resume driving.

A physical therapist can guide you in assessing your ability to drive. You can also practice driving on your own by going to a location, such as an empty parking lot, where you can assess your ability to brake and to control the vehicle without worries.

Medication

Never take narcotic pain medication before getting behind the wheel. Narcotics can cause drowsiness, which in turn can cause delayed reaction. Driving while taking narcotics, even those your doctor has prescribed, is illegal and can result in a "driving under the influence" citation involving exorbitant fines, driver's license restrictions, and possible imprisonment.

Upper extremity

Immobilization

Following orthopaedic surgery on the upper extremity, casts, slings, and splints are often used to immobilize the affected body part. These devices are a major impediment to operating a vehicle; studies have shown that the immobilization of an arm can hamper the ability to handle a car safely. For example, a study published in *ANZ Journal of Surgery* reported that driving instructors tasked with assessing the driving performance of healthy volunteers failed all the participants who had arms in casts extending above the elbow or just short of it.[3] In another study, published in *Injury* in 2009, volunteers were placed in casts below their elbows before having their driving ability assessed in a driving simulator.[4] Researchers found that although the volunteers drove more carefully when their arms were in casts, they responded more slowly to driving hazards. A third study, presented at the 79th Annual Meeting of the American Academy of Orthopaedic Surgeons, included volunteers who had their arms placed in slings and their driving skills assessed using a driving simulator.[5] The authors found that those wearing slings were involved in more accidents. Overall, these 3 studies indicate that wearing a cast, sling, or splint can significantly impact your driving.

Lower extremity

Total hip or knee replacement

Many patients are comfortable driving 6 to 8 weeks after hip or knee surgery. Several studies have looked at the length of time required for patients to be able to brake after undergoing a total hip or knee replacement and found no difference in braking time between those who had hip or knee replacement on the left side and a control group. For patients with right hip or knee replacement, however, the time required to brake took 6 to 8 weeks to return to normal after surgery, from which point it continued to improve for up to a year.[6]

Knee arthroscopy (knee scope)

Driving after knee arthroscopy has also been studied. When patients underwent partial meniscectomy (removal of the cartilage ring inside the knee joint), the time required to brake did not return to normal until 4 weeks after surgery. Following anterior cruciate ligament (one of 4 main ligaments of the knee joint) reconstruction on the left leg, patients' braking ability returned to normal after 2 weeks; however, when the same procedure was performed on the right knee, braking ability did not return to normal until 6 weeks after surgery.[7]

Surgery on the foot and ankle

After foot and ankle surgery, pain may hinder a patient's ability to brake quickly. For example, studies done on driving after bunion surgery found that the patient's braking ability was still impaired 6 weeks after surgery.[8] Similarly, a study on driving after ankle fusion found patients' braking time to be slower than normal after surgery.[9] An additional problem with these surgeries is that if a patient attempts to drive before a foot or ankle has completely healed, the force required to apply the brake while driving could damage the surgical site.

The decision about when a patient can safely return to driving following orthopaedic surgery on either an upper extremity or one of the lower extremities is complex and difficult. In general, the patient should expect to be restricted from driving for a minimum of 4 to 6 weeks after surgery—longer if the surgery involves his or her right side. Before a patient resumes driving, he or she should be off narcotic pain medications and, if the surgery was on the upper extremity, no longer wearing a cast, sling, or splint. If the surgery was on the lower extremity, a patient should be able to bear his or her weight on the affected side without using an aid.

Before resuming driving, you should discuss your limitations with your physician or physical therapist and take the time to do some practice drives. While your practitioner can give you a general time frame for driving resumption, it is up to you to consider whether and to what degree such factors as your pain level, medications, or orthosis will affect your driving. Remember, you are responsible for what happens when you operate a vehicle, so make sure that you can drive safely before getting behind the wheel.

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