Hughston Health Alert

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VOLUME 38, NUMBER 1 - WINTER 2026

Inside...

Adolescent Idiopathic Scoliosis (AIS)

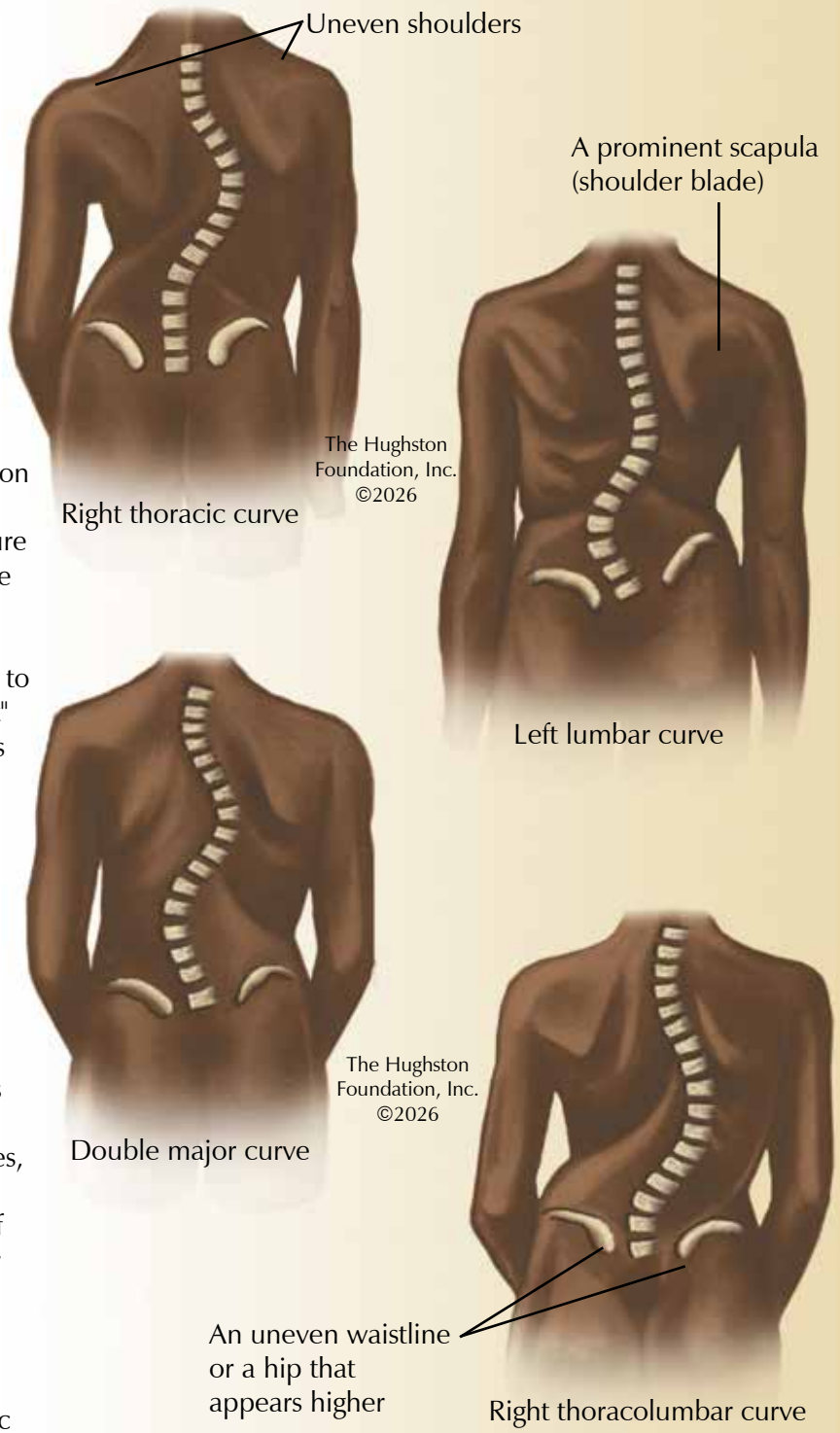
Adolescent idiopathic scoliosis (AIS), the most common type of spinal deformity that affects children, is characterized by an abnormal 3-dimensional curvature of the spine measuring 10 degrees or more (**Fig. 1**). The word "scoliosis" comes from the Greek term "skoliosis," which means crookedness. Scoliosis is a deformity that causes the spine to curve to the side and the vertebrae to rotate into an abnormal position. The term "adolescent" signifies the onset between the ages of 10 and 18 years old, coinciding with the growth spurt of teenagers that begins at puberty. "Idiopathic" means that the cause of this spinal deformity is unknown, which distinguishes it from other, rarer types of scoliosis that result from congenital (present at birth) or neuromuscular (control of muscles by nerves) causes.

AIS is not rare, with an estimated prevalence of 3 to 5 percent of teenagers affected. In the United States, this translates to an estimated 6 to 9 million people living with scoliosis. The female-to-male ratio increases substantially with increasing size of curve, rising from 1.5 girls for every 1 boy in curves from 10 to 20 degrees, up to 10 girls for every 1 boy in curves greater than 30 degrees. While the prevalence of AIS affects millions of people, physicians manage most cases using bracing or other conservative treatments.

Clinical presentation and symptoms

AIS, a silent condition in its early stages, typically produces no pain or other symptoms; however, specific curve types, such as thoracic, lumbar, or thoracolumbar,

Fig. 1. Types of adolescent idiopathic scoliosis (AIS) curves



can be physically noticeable. Often, it is first noticed by a parent, teacher, or during a routine school screening or physical examination.

Box. The curve can cause other visual signs, which are primary indicators of the disorder, such as:

- Uneven shoulders, with one appearing higher than the other,
- A prominent scapula (shoulder blade) that sticks out,
- An uneven waistline or a hip that appears higher,
- The head is not centered directly above the pelvis,
- A visible rib prominence or "hump" on one side of the back when bending forward.

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While mild back pain can occur, severe pain is not characteristic of AIS. Children with back pain should see their pediatrician for further evaluation.

Diagnosis

Early detection and treatment are crucial for managing scoliosis effectively, as curves are often easier to treat when they are smaller. An orthopaedist can diagnose AIS without any invasive or painful testing, using a combination of physical examination and x-rays.

The physical examination includes the Adam's Forward Bend Test, which continues to be the cornerstone of clinical screening for the disorder. (**Fig. 2**). The patient bends forward at the waist with their feet together, arms hanging down, and knees straight. From this position, the examiner can easily observe any asymmetry in the rib cage or lumbar region, known as a rib hump, which indicates rotational deformity of the spine.

If the physician suspects scoliosis, standing x-rays of the entire spine, including frontal and side views, are ordered (**Fig. 3**). These images are important for visualizing the spinal curvature and confirming the diagnosis. The severity of the curvature can be measured using the Cobb angle, which is the standard method for quantifying the magnitude of the deformity. X-rays also aid with assessing the skeletal maturity of the adolescent to see whether the child is still growing, which helps predict the risk of progression. The x-ray also visually shows the physician the curve pattern, location, and direction of the curve.


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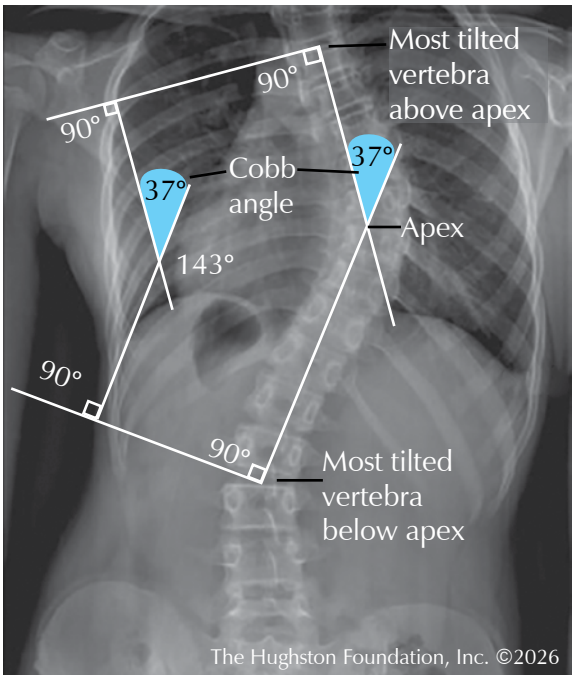
Fig. 2. Adam's Forward Bend Test - showing visible spine curvature, asymmetry in the shoulders and hip alignment.

Fig. 3. X-ray showing the severity of the spine curvature using the Cobb Angle.



Risk factors

Despite extensive research over the past 100 years, the exact cause of AIS remains elusive. Researchers have pointed to theories, such as genetics, hormones, biomechanical, and neuromuscular issues that may contribute to the condition. Although considered a multifactorial condition with several contributing elements, researchers have found that poor posture, carrying heavy backpacks, sports injuries, trauma, or diet do not cause the disorder.

AIS often runs in families, suggesting a strong genetic link. Research has identified several candidate genes, but scientists have not found a single causative gene. This leaves us with an inheritance pattern that remains complex and not fully understood. The condition's emergence during the rapid growth of adolescence suggests that hormones and growth-related factors play a crucial role; however, their definitive role is unconfirmed. Some theories propose subtle abnormalities in the central nervous system, postural control, or the biomechanical properties of the spinal discs and ligaments (tissues that connect bones), which may lead to spinal instability and progressive curvature during growth. Unfortunately, even after extensive research, we do not have a proven theory explaining the cause of AIS.

Risk factors for curve progression

Sex: Females are diagnosed more often and have a higher risk of curve progression.

Curve magnitude: The larger the curve at the time of diagnosis, the more likely it is to worsen.

Skeletal immaturity: A growing individual has a longer window for the curve to progress.

Curve pattern: Certain curve patterns, such as double curves, may have a higher risk of progression than single curves.

Management and treatment

The primary goals of AIS treatment are to stop curve progression and prevent severe deformity; thereby, avoiding future health problems like chronic pain, or in very rare and severe cases, compromised lung function. Physicians base treatment decisions on the size of the spinal curve, whether the child is still growing, and observation of curve progression. The 3 main treatment strategies are observation, bracing, and surgery. Physicians treat approximately 90% of cases without the need for surgery.

1. Observation: Many small curves do not progress and require no further intervention. For mild curves (a Cobb angle less than 20 to 25 degrees), the physician monitors the patient using regular clinical examinations and x-rays every 4 to 6 months to track any changes in the curve.

2. Bracing: For moderate curves, typically 25 to 45 degrees, the physician may prescribe a brace while the patient continues to grow. Bracing does not correct the curve; it helps to prevent the deformity from progressing during the remaining growth period. For bracing to be effective, the patient should wear the brace for the prescribed number of hours per day, which can be from 16 to 23 hours per day.

3. Spinal fusion surgery: Less than 10 percent of AIS cases require surgery. Physicians often recommend surgery for severe curves, greater than 45 to 50 degrees, or for curves that continue to progress despite bracing. Surgery can permanently correct a significant portion of the deformity and prevent any future progression.

Prognosis

For most adolescents, the prognosis for AIS can be excellent. With early detection and appropriate management, the vast majority of patients can lead full, active, and healthy lives with no physical limitations. Observation prevents unnecessary treatment for mild curves, while bracing can be an effective tool for halting the progression of moderate curves. For those with severe curves, modern surgical techniques offer reliable and lasting correction. Public awareness and screening programs remain vital for identifying at-risk individuals and ensuring they receive timely and effective care.

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Contrast Therapy: Just a social media trend?

Contrast therapy, also called hot-cold immersion therapy, involves alternating bodily exposure to heat and cold, such as sauna, steam room, ice bath, cold plunge, etc. Historically, contrast therapy has been used in the treatment of injuries, for example, alternating between a heating pad and ice to treat muscle strains or ankle sprains (**Fig.1**). More recently though, there has been a focus on contrast therapy as a means to aid in post-exercise recovery, especially in high-level athletes. Social media has also popularized sauna and cold plunge therapy as a way to promote mental health, energize the body, burn fat, and increase overall health and wellness.

Did you know that variations of contrast therapy have been used for centuries? It's true! Daily sauna use is a staple of Nordic and Finnish populations, and countries with colder climates, such as Iceland, have long-used cold-water immersion in their daily routine. Even Japan integrated natural hot spring use into its culture thousands of years ago.

Fig. 1. Injury example, and ice treatment for ankle sprain.

How does it work?

The biology behind contrast therapy is fairly simple. Exposure to heat causes blood vessels to dilate (enlarge); whereas, exposure to cold causes blood vessels to constrict (narrow). This cycle of blood vessel dilation and constriction promotes the body's normal healing and recovery processes. More specifically, blood vessel dilation increases blood flow to the skin and muscles. Red blood cells carry oxygen as they travel, allowing muscles to replenish their oxygen stores and recover at a faster rate (**Fig. 2**). Additionally, exposure to heat promotes sweating, which is one of the body's natural ways of eliminating toxins. Finally, exposure to heat can promote muscle relaxation and inhibit muscle spasms, allowing you and your muscles to relax following strenuous exercise.

On the other hand, exposure to cold and subsequent blood vessel constriction decreases blood flow to the muscles and skin, and instead directs it to the most vital organs, such as the heart and brain. Cold also stimulates the central nervous system, which over time can reinforce the body's immune systems. This combination of directed blood flow to the brain and nervous system stimulation also facilitates alertness, mental sharpness,

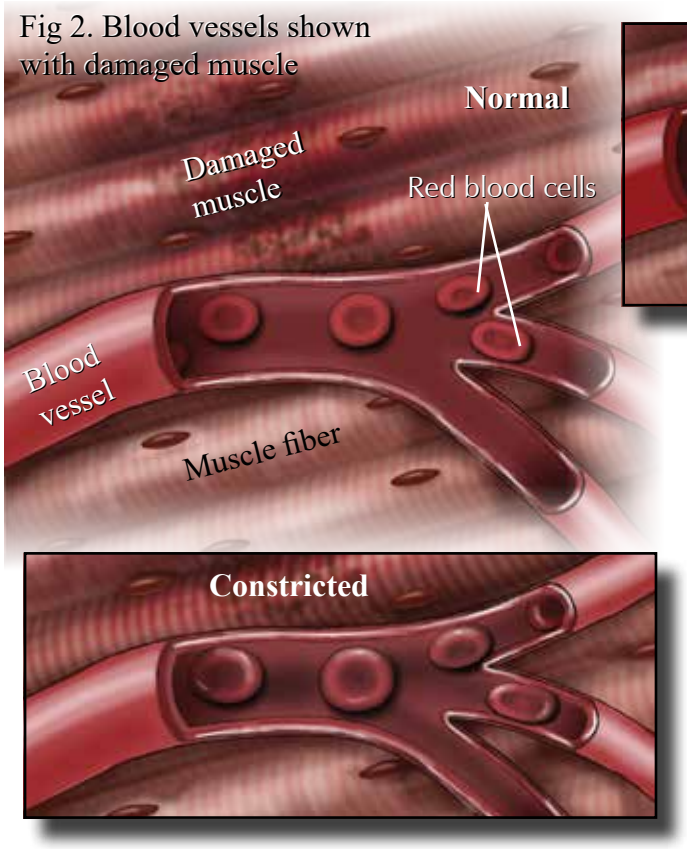

Fig 2. Blood vessels shown with damaged muscle

and feelings of clarity, which are 3 of the most common advertised benefits of popularized cold plunges. Finally, as you stress your body during exercise, your immune system generates inflammation in the joints and muscles. Exposure to cold combats this inflammation and swelling, reducing joint pain and muscle fatigue.

Is it right for you?

First, you need to recognize that contrast therapy is a form of working out. It stimulates the body to produce certain responses, but without the mechanical stress of lifting weights or going for a run, for example. Overall, contrast therapy can be a great natural therapy as long as you use it safely.

Contrast therapy exists on a spectrum of both temperature and time of exposure. As with any new workout, it's important to start small and work your way up. In this case, start with more mild hot and cold temperatures and for shorter amounts of time. You may increase or decrease the temperature and increase length of exposure as your body allows. Consistency is the key to building stamina.

Are there any risks?

Despite being a natural form of therapy, contrast therapy still possesses risk of skin damage, dehydration, and worsening of cardiovascular conditions. Extremes of temperature can cause burns, leading to skin wounds and infection. Additionally, sauna or steam room use in the postexercise period risks significant dehydration, emphasizing the importance of hydration before, during, and after exercise and therapy. Finally, due to its effects on blood vessels, contrast therapy may worsen heart disease temporarily or cause arrhythmias (changes in heart rhythm) due to variations in nervous system stimulation. Please be sure that you have any medical conditions well-controlled before starting contrast therapy.

So, does it actually work?

Yes, it does! Clinical research has proven that contrast therapy produces changes in blood flow, reduces pain and stiffness, and promotes muscle relaxation. It has also shown that more intense versions of contrast therapy, such as infrared and cryotherapy, significantly increase these responses compared to immersion therapies.[1] However, there is no clear evidence that contrast therapy provides any benefit over other therapies in the treatment of injuries or in post-exercise recovery. We need more research to provide detailed guidelines and the specific physiologic benefits of contrast therapy.

Just as there is no perfect formula for exercising, losing weight, or building muscle, contrast therapy and its benefits are unique to each individual. Contrast therapy does produce a physiologic response in the body, but the effects may not be any better than other therapies. Still, high-level athletes and coaches alike justify its use through positive personal experiences such as improved recovery and in prevention of injuries. Since contrast therapy can be a great option for most individuals, here are a few recommendations to get started:

- Sauna first, then you should cold plunge.
- Start small by beginning with 5 minutes of sauna or steam therapy, followed by 1 to 2 minutes of cold plunge.
- Reinforce your body's natural recovery. Your optimal time for contrast therapy should be immediately after a workout or exercise because your muscles need oxygen, inflammation is building up, and your nervous system is stressed.
- Hydrate before, during, and after therapy.
- Listen to your body. If you feel weak, nauseous, or lightheaded, stop therapy immediately. Allow your body to recover naturally and try again a different day. It takes time for the body to adjust to contrast therapy.
- Consistency is key.

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1. Hing WA, White SG, Bouaaphone A, Lee P. Contrast therapy--a systematic review. Physical Therapy in Sport. 2008;9(3):148-161.

Rotator Cuff Tears

The American Academy of Orthopaedic Surgeons reports that approximately 4.5 million patient visits occur each year because of shoulder pain. Ultimately, many of these patients are diagnosed with a torn rotator cuff. A rotator cuff injury is a strain (stretching or tearing a muscle or tendon) in the muscle group that holds your shoulder joint together. Rotator cuff injuries affect both athletic and nonathletic populations, causing shoulder pain, weakness, and decreased range of motion. Common and treatable, rotator cuff tears can result from a traumatic injury to your shoulder, with increasing age, or from activity-related degenerative changes.

Anatomy

The rotator cuff holds the humeral head in place and helps to stabilize the shoulder (glenohumeral) joint (**Fig. 1**). The rotator cuff is a collection of 4 tendons that attach muscles to the head of the humerus (upper arm bone). The supraspinatus, infraspinatus, teres minor, and subscapularis muscles facilitate a wide range of motion, especially during certain activities like throwing, lifting, swimming, or reaching. The supraspinatus aids with abduction (lifting the arm out to the side), while the infraspinatus and teres minor muscles assist with external rotation, or rotating the arm outward. The subscapularis helps with internal rotation, or rotating the arm inward. (**Fig. 2)**

Risk factors

Rotator cuff tears can occur acutely (suddenly) or chronically (long-term) from multiple causes. Acute injuries happen after a traumatic event, such as a fall, lifting something heavy, a sporting accident, or a shoulder dislocation. Chronic tears typically develop over a prolonged period in the older population from intrinsic degeneration (deterioration of tissue) or chronic impingement (persistent compression). Many factors can contribute to rotator cuff tears. A specific factor to consider is repetitive overhead motion, which can make throwing athletes, swimmers, painters, and carpenters more vulnerable to rotator cuff tears. Other risk factors include increasing age, smoking, a family history of rotator cuff tears, or other medical conditions, like hypercholesterolemia (high cholesterol).

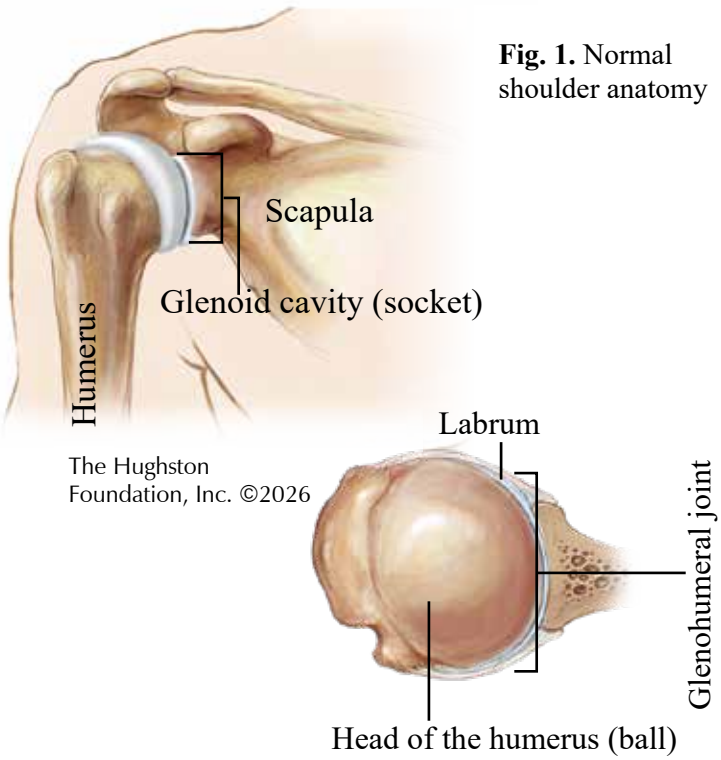

Fig. 1. Normal shoulder anatomy

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Diagnosis

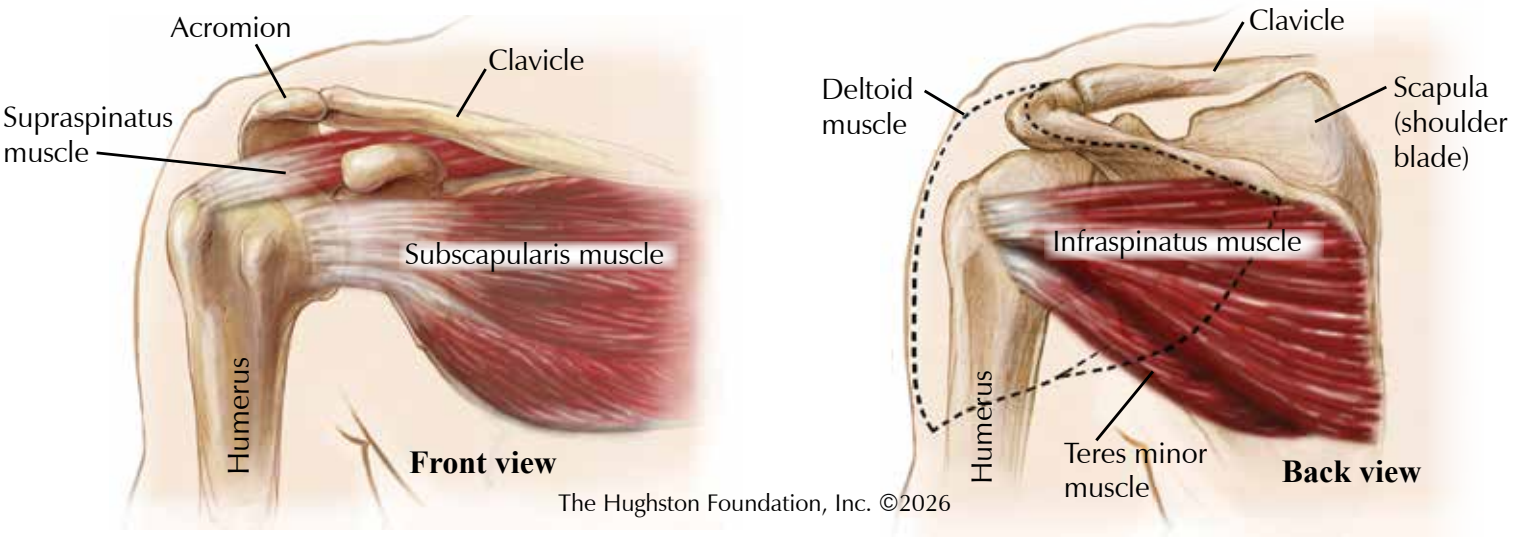
Diagnosing rotator cuff injuries is characteristically a clinical finding. During a clinic visit, the orthopaedist completes a careful medical history and asks about symptoms and exacerbating factors. The doctor also performs a thorough physical exam using specialized tests that help pinpoint the torn rotator cuff tendon. Imaging tools, such as radiographs (x-ray), arthrogram (x-ray that uses contrast), magnetic resonance imaging, or MRI (shows bones, muscles, tendons, and ligaments), or ultrasound (uses soundwaves to view inside the shoulder), can assist in making or confirming a diagnosis. Most orthopaedists consider MRI the diagnostic standard for rotator cuff injuries because it provides detailed images of the surrounding muscles and helps to evaluate bone quality.

Treatment options

There are both nonsurgical and surgical treatment options for rotator cuff tears, depending on your age and overall health, activity level, mechanism, size, and chronicity (duration) of the tear, and degree of muscle atrophy (shrinkage). First-line nonsurgical options include rest, activity modification, physical therapy, nonsteroidal anti-inflammatory medications (NSAIDs), and corticosteroid injections. Physical therapy focuses on rotator cuff strengthening and scapular-stabilizing exercises. Physicians often treat patients who have partial rotator cuff tears or have low-activity lifestyles with these nonsurgical treatments.

Surgeons can perform rotator cuff surgery using a minimally invasive approach through small incisions, called arthroscopic surgery (a tiny camera and instruments are inserted into the joint) or through an open, larger incision. Your surgeon will choose the best approach based on your injury. This might involve cleaning out the joint space (decompression or debridement) or rotator cuff repair to reattach the torn tendons. In severe cases with massive or irreparable tears, it may be more practical to perform a tendon transfer or shoulder replacement surgery. Postoperatively, you need consistent physical therapy to restore motion and strength. You can expect to return to play or work without restrictions approximately 6 months after surgery; however, the exact timeline is patient-dependent.

Fig. 2 Normal muscular anatomy of the shoulder



Rotator cuff surgery does not come without risks. One of the most common complications after surgery is rotator cuff tear recurrence, which happens when the cuff tissue fails to heal. Surgery failure or a recurrent tear is more likely to occur in patients who have diabetes, are over age 65, smoke, had a large tear, and did not follow postoperative recommendations. Other notable complications include neurovascular injury, infection (with an incidence of <1%), and joint stiffness.

Prevention

Preventative strategies can help you avoid rotator cuff injury. For active individuals, warming up prior to sporting activities and performing all maneuvers using the correct technique and mechanics can help strengthen your shoulder. With exercise that focuses on stretching and strengthening the rotator cuff and stabilizing the muscles that attach to the scapula, you can keep the shoulder muscles strong and flexible.

The rotator cuff tendons can become inflamed, partially torn, or completely torn. How your doctor treats it depends on the size of the tear and how much it hurts. If your tear is minor and it does not affect or change your lifestyle, you and your physician may decide to let it heal without much intervention. On the other hand, if you have a large, painful tear that affects your daily living, your orthopaedist may recommend surgery. By properly diagnosing and treating your injury, you can regain strength, function, and return to your desired activities. With enhancements in research, conservative treatment modalities, and surgical techniques, a pain-free shoulder is possible.

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Prolonged CoVID Syndrome: Fact, Fiction, Folly, and Myth

At the outset, the label of "Prolonged CoVID Syndrome (PCS)" or "Long CoVID" has a similar connotation as Typhoid Mary, The Hundred Years War, The Dark Ages, or The Bubonic Plague. Modern myths, misleading information from our own government and social media, as well as broadcast media shenanigans, collectively created panic, fear, and a feeling of ennui (despair). All of this for a viral illness that, like most other viral illnesses, requires a calm and commonsense approach.

CoVID is a virus, technically labeled as 2019 Novel Corona Virus-2. It gained notoriety in 2019 when it was the causative agent in a worldwide epidemic of viral infections called CoVID-19 disease. The disease characteristics include fever, lethargy, breathlessness, muscle achiness, fatigue, headaches, dry cough, chest tightness, and altered thinking. Like many common microbes, this virus can cause death when contracted by individuals who already have a compromised (weak) immune system.

"Prolonged, or Long, CoVID" is a condition in which some of the symptoms persist far beyond the expected recovery period of about 2 weeks, which can be many weeks or months later. For some, it may be years. Additionally, and probably quintessential to PCS, there is a phenomenon called "CoVID brain fog" which resembles having had a concussion and now experiencing irritability,

attention disorders, sleep disorders, difficulty with arithmetic and relationships, headaches, problem-solving activities, depression, fatigue, decreases in the senses of taste and smell, and a chronic dry cough. Similar to the acute illness, the prolonged form can be difficult to diagnose because available tests are not 100% reliable, since they lack sensitivity and the particularities of the condition. Physicians base the diagnosis on the history rather than the physical findings or lab tests. (**Fig**.) The current thought is that most of these problems that are lumped together under the label of PCS may be residual inflammatory processes as well as disorders of metabolism and disordered neurotransmitter chemicals.

What else could be responsible for these long-term problems? There are several well-known conditions that need to be considered. Hypothyroidism, pernicious anemia (low hemoglobin), adrenal insufficiency (kidney disease), seasonal affective disorder, situational depression, Epstein-Barr viremia (also called Mono), fibromyalgia, and even paroxysmal atrial fibrillation can cause many of these symptoms. However, with the proper testing physicians can eliminate these conditions.

Treatment focuses on returning the patient to their original functional state. The treatment plan must be individualized and tailored to the patient's special needs and capabilities. The foundation of any treatment must include well-rounded nutrition, active rest, restful sleep, mindfulness, relearning how to stay on task, and returning to an active routine to include work and play. The unproven, yet often included, treatments include nutritional supplements, fortified drinks, herbal additives, ultraviolet light therapies, and magnet applications.

The outlook for these patients can be bright if the patient understands that recovery will take time; possibly, 8 to 12 weeks, so patience is the key. The patient must be convinced that they can change the focus of their life from this compromised state to a life of unlimited potential. The patient should be educated about the fact that this will not shorten their life and that they are in control of their recovery.

Patients can achieve the best outcome with a common-sense approach to nutrition, outdoor activity, adequate sleep, and limiting unnecessary medication use. The pitfalls to treatment come from pursuing treatments that have unproved claims for success, making treatment decisions under duress, or panicking whenever there is a setback. Patients must be careful about where news items and treatment recommendations originate. Information from pharmaceutical companies must be weighed regarding the true intention of the drug maker. Patients should not prioritize government agencies over their own private physician.

In the final analysis, no one can be totally certain in making an accurate diagnosis of prolonged CoVID syndrome, let alone prescribing a guaranteed treatment. The best advice that physicians can offer is for the patient to take personal responsibility for his or her own health and consult with a doctor that they trust. Never forget the healing properties of getting outdoors in the sunshine and performing gentle exercise enough to break a sweat.

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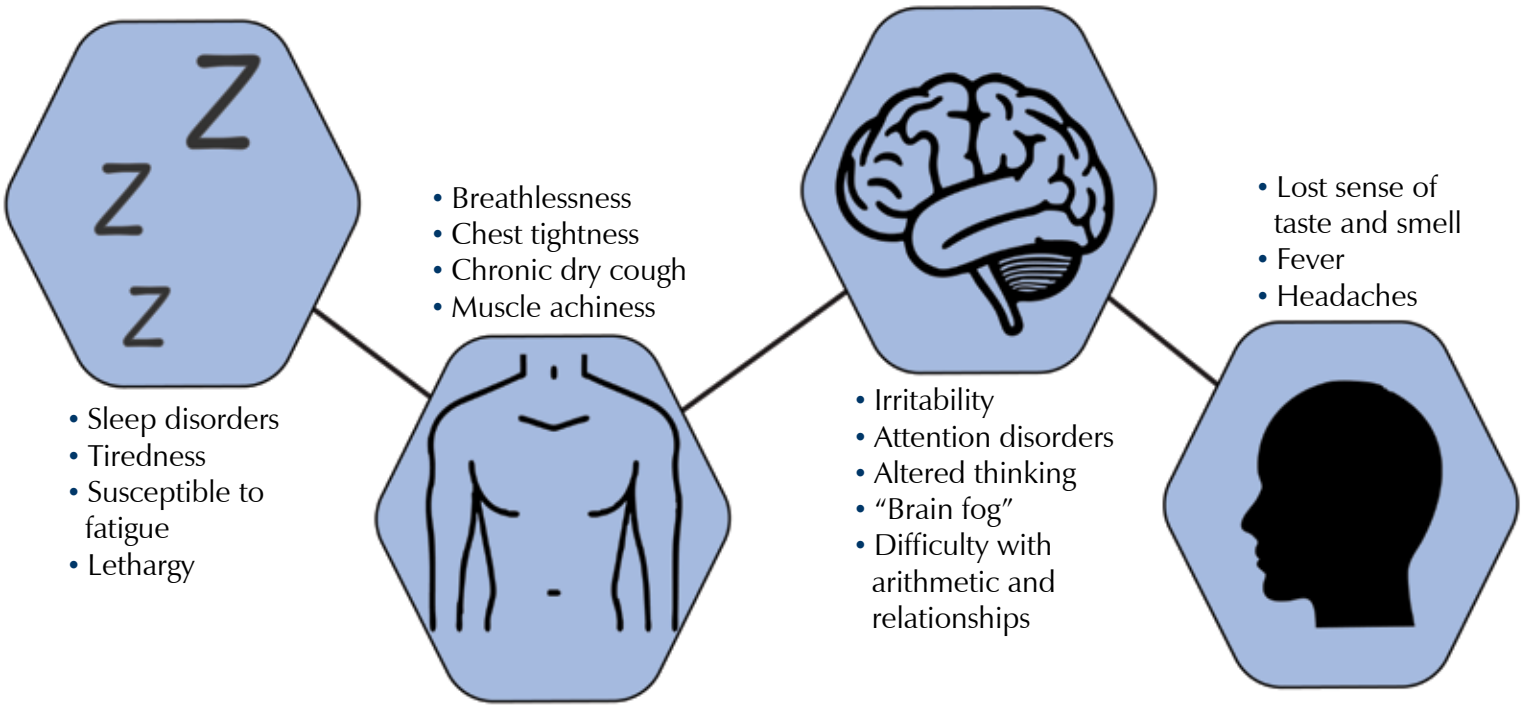
Fig. Symptoms of prolonged CoVID.



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ISSN# 1070-7778

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