

# PART 1

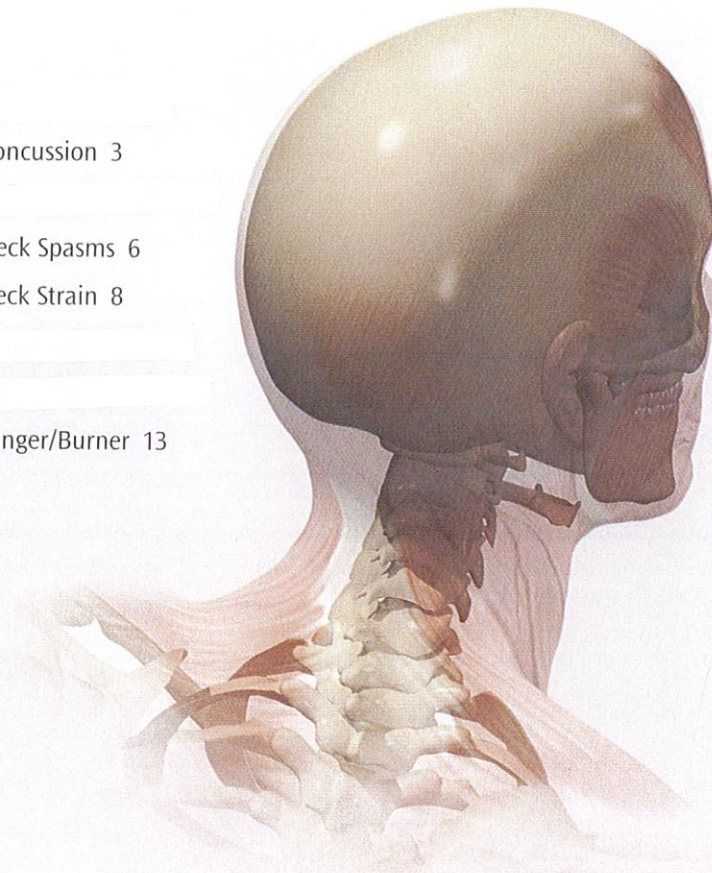
## *The Head and Neck*

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# CONCUSSION

## What is a concussion?

A concussion is an injury to the brain caused by a blow to the head. A concussion may cause you to become temporarily confused or disoriented, have memory loss (amnesia), or become unconscious. Concussions are the most common head injuries in sports.

## How does it occur?

A concussion occurs when a blow to the head causes shaking, jarring, stretching, swelling, or tearing of brain tissue and delicate nerve fibers.

The sports in which concussions most commonly occur are football, gymnastics, ice hockey, and wrestling. However, concussions can occur in any sport or activity where you may get hit in the head.

## What are the symptoms?

If you have had a concussion you may have any of the following symptoms:

- headache
- confusion
- memory loss (amnesia)
- loss of consciousness
- sleepiness
- nausea or vomiting
- trouble concentrating
- dizziness
- weakness
- seizures
- loss of balance

You may have these symptoms, called post-concussive syndrome, for several days, weeks, or longer after the injury.

## How is it diagnosed?

Your healthcare provider will examine you and find out what happened. If you can't remember what happened, he or she may need to get this information from other people who saw the accident. Your healthcare provider will do a neurologic examination, testing your strength, sensation, balance, reflexes, and memory. He or she will also look at your eyes with a flashlight to see if your pupils are the same size. You may be tested again several times during the next hour to detect any worsening of brain function, which might occur if you have any bleeding or swelling in the brain.

Your provider may do a special X-ray called a computed tomography (CT) scan or a magnetic resonance image (MRI) of your head to be sure there is no damage to your brain. Depending on how your head injury occurred, you may have neck X-rays to check your spine.

Concussions have been graded as I, II, or III, depending upon the severity of the confusion, amnesia, or loss of consciousness. Some providers may use the terms simple or complex to describe the severity of a concussion.

## How is it treated?

The treatment for a concussion is REST. This means you may need to miss classes and assignments if you are a student, or work if you have a job. Exercising too soon will make your symptoms last longer and may cause more problems.

Headache may be treated with a mild pain reliever, such as acetaminophen. Nausea may be treated with a prescription medicine.

If you have had a concussion, you need to be watched by a friend or relative for 8 to 12 hours. You should be awakened and checked every 2 to 4 hours while sleeping. Symptoms to report to your healthcare provider include:

- confusion
- seizures
- unequal pupil sizes
- restlessness or irritability
- trouble using your legs or arms
- worsening vomiting
- headache that will not go away after being treated with acetaminophen (Tylenol)
- garbled speech
- bleeding from the ears or nose
- decreasing alertness
- unusual sleepiness
- unusual behavior

If you are stable and recovering during the next 24 hours, you should rest for an additional day or two. As your symptoms go away, you can begin to go back to your usual daily routine. However, you should stay away from any activities that would risk reinjury. A second concussion before the first one has healed could be very serious. Your healthcare provider will tell you when it is safe to return to sports and other activities.

### When can I return to my sport or activity?

To avoid complications from the concussion, it is very important that you do not return to your sport or activity too soon. After a very mild concussion, you may be allowed to return to your sport or activity within a few days. Anyone with a concussion should not return to playing the same day. If you had a loss of memory or loss of consciousness, you may not be able to return for 1 week. After a severe concussion, you may not be able to return to sports for up to 1 month. However, some people with a very mild concussion may have symptoms that last longer than what is expected. Some people who have a more serious injury may recover quickly. Your provider will tell you when you can safely return to your sport based on your symptoms.

If you have had repeated concussions, your health-care provider may talk to you about limiting your participation in certain sports.

### How can I prevent a concussion?

A concussion is caused by a blow to the head. It is important in contact sports that you wear proper protective head gear that fits well. In sports such as football, it is important to use proper blocking and tackling techniques and not to use your head for initial contact. In sports such as bicycling and rollerblading, wear a helmet. Wearing a mouthpiece may also help prevent concussions.

When accidents do happen, however, concussions can be severe. It is especially important to understand that receiving a second blow to the head before the first injury is fully healed can be fatal, even if the second injury seems minor.

# NECK SPASMS

## What are neck spasms?

Neck spasms are involuntary contractions of the muscles in your neck. The muscles become tight, hard, and painful.

## How do they occur?

Neck spasms may occur from an injury, overuse, poor posture, or stress. For example, it is common for a person doing a lot of computer work to feel his or her neck stiffen. Spasms may even occur from an uncomfortable night's sleep.

## What are the symptoms?

The muscles in your neck feel hard, tight, and painful. When the muscles that extend from your shoulders to your head go into spasm, the spasms may even cause headaches. You may have tender spots in your neck, sometimes called trigger points, that cause pain elsewhere.

## How are they diagnosed?

Your healthcare provider will review your medical history and examine your neck.

## How are they treated?

- **Stretching:** Spasms are best treated with stretching exercises.
- **Massage:** You may be able to massage your neck yourself by finding the tight muscles and putting deep pressure on these muscles. You might also get a massage from a friend or therapist.
- **Medicine:** Your healthcare provider may recommend an anti-inflammatory medicine, such as ibuprofen or naproxen, or may prescribe a muscle relaxant (adults aged 65 years and older should not take non-steroidal anti-inflammatory medicine for more than 7 days without their healthcare provider's approval).
- **Ice:** If your neck spasm has just occurred, put ice packs on your neck for 20 to 30 minutes three to four times a day.
- **Moist heat:** Sometimes, especially with recurrent spasms, moist heat can help. Put warm, moist towels on your neck for 20 minutes, or take hot showers or baths.

- **Physical therapy:** Your healthcare provider may recommend seeing a physical therapist for an exercise program and other treatments.
- **Injection:** If the above treatments do not help the spasm get better, your healthcare provider may recommend a shot of an anesthetic or a medicine like cortisone into the muscle.
- **Stress management:** Neck spasms are a common physical symptom caused by stress or depression. Identification of these problems and treatment of them may help considerably with neck spasms.

## When can I return to my sport or activity?

You may return to your sport or activity when:

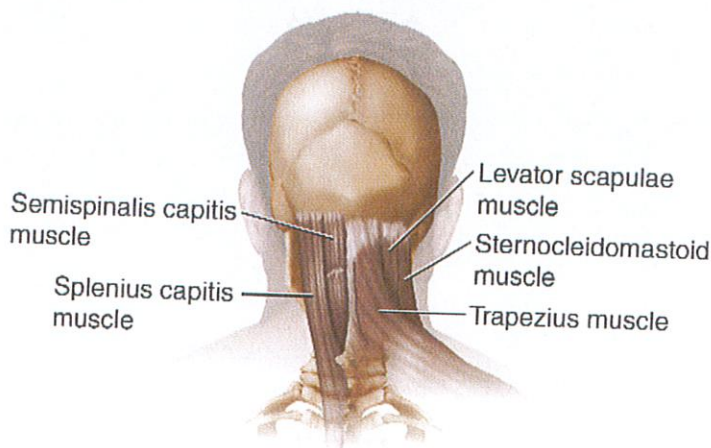
- You no longer have neck pain.
- You can move your neck fully and comfortably.

## How can I help prevent neck spasms?

Know what you can do about the common causes of neck spasm: overuse, stress, and poor posture. For example, use good posture at your computer terminal, take frequent breaks, and do stretching exercises.

When you first feel tightness or pain in your neck, start the treatment that has helped you the most. Treating early, mild symptoms right away can often stop the symptoms from becoming worse.

## NECK SPASMS



# NECK SPASM REHABILITATION EXERCISES

You may do these exercises right away.

## 1. NECK ROTATION WITH FLEXION:

**Right:** Turn your head to the right and clasp your hands behind your head. Let the weight of your arms pull your chin to the right side of your chest. Relax. Hold for a count of 15. Do this 3 times.

**Left:** Turn your head to the left and clasp your hands behind your head. Let the weight of your arms pull your chin to the left side of your chest. Relax. Hold for a count of 15. Do this 3 times.



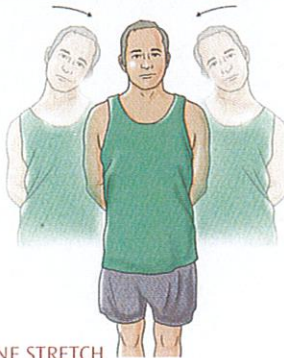
NECK ROTATION WITH FLEXION



CHIN TUCK

**2. CHIN TUCK:** Place your fingertips on your chin and gently push your head straight back as if you are trying to make a double chin. Keep looking forward as your head moves back. Hold 5 seconds and repeat 5 times.

**3. SCALENE STRETCH:** This stretches the neck muscles that attach to your ribs. Sitting in an upright position, clasp both hands behind your back, lower your left shoulder, and tilt your head toward the right. Hold this position for 15 to 30 seconds and then come back to the starting position. Lower your right shoulder and tilt your head toward the left until you feel a stretch. Hold for 15 to 30 seconds. Repeat 3 times on each side.

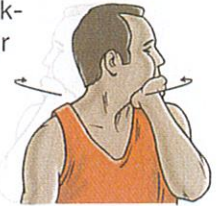


SCALENE STRETCH

## 4. NECK ROTATION STRETCH

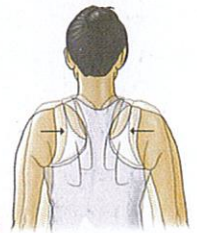
**Right side:** Rotate your neck by looking over your right shoulder. Lift your right hand and place your palm on the left side of your chin. Push your chin with your palm toward your right shoulder. Hold for a count of 10. Do this 3 times.

**Left side:** Rotate your neck by looking over your left shoulder. Lift your left hand and place your palm on the right side of your chin. Push your chin with your palm toward your left shoulder. Hold for a count of 10. Do this 3 times.



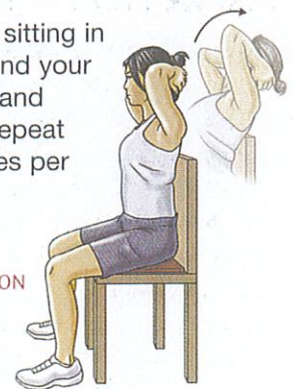
NECK ROTATION STRETCH

**5. SCAPULAR SQUEEZE:** While sitting or standing with your arms by your sides, squeeze your shoulder blades together and hold for 5 seconds. Do 3 sets of 10.



SCAPULAR SQUEEZE

**6. THORACIC EXTENSION:** While sitting in a chair, clasp both arms behind your head. Gently arch backward and look up toward the ceiling. Repeat 10 times. Do this several times per day.



THORACIC EXTENSION

# NECK STRAIN

## What is a neck strain?

A strain is a tear of a muscle or tendon. Your neck is surrounded by small muscles, that run close to the vertebrae, and larger muscles, that make up the visible muscles of the neck.

## How does it occur?

Neck strains most often occur when the head and neck are forcibly moved, such as in a whiplash injury or from contact in sports. Sometimes strains can occur from an awkward position during sleep or poor posture while working at a computer.

## What are the symptoms?

You have pain in your neck. When the neck muscles go into spasm you feel hard, tight muscles in your neck that are very tender to the touch. You have pain when you move your head to either side or when you try to move your head up or down. The spasming muscles can cause headaches.

The pain may start right after an injury or may take a few hours or days to develop. Other symptoms may include neck stiffness, dizziness, or unusual sensations, such as burning or a pins-and-needles feeling.

## How is it diagnosed?

Your healthcare provider will examine your neck. Your neck muscles will be tender and tight. You may have pain over the bones in your neck. Your healthcare provider may order X-rays to make sure the vertebrae are not injured.

## How is it treated?

Right after the injury you should place an ice pack on your neck for 20 to 30 minutes every 3 or 4 hours for 2 to 3 days or until the pain goes away.

Your healthcare provider may prescribe an anti-inflammatory medication and a neck collar to support your neck and prevent further injury (adults aged 65 years and older should not take non-steroidal anti-inflammatory medicine for more than 7 days without their healthcare provider's approval).

If you still have neck pain several days after the injury and after using ice, your healthcare provider may recommend using moist heat on your neck. You can buy a moist-heat pad or make your own by soaking towels in hot water. Put moist heat on

your neck for 20 to 30 minutes every 3 or 4 hours until the pain goes away. You may find that it helps to alternate putting heat and ice on your neck.

## How long will the effects last?

The length of recovery depends on many factors such as your age, health, and if you have had a previous neck injury. Recovery time also depends on the severity of the injury. A mild injury may recover within a few weeks, whereas a severe injury may take 6 weeks or longer to recover. Ask your healthcare provider when you can return to your normal activities.

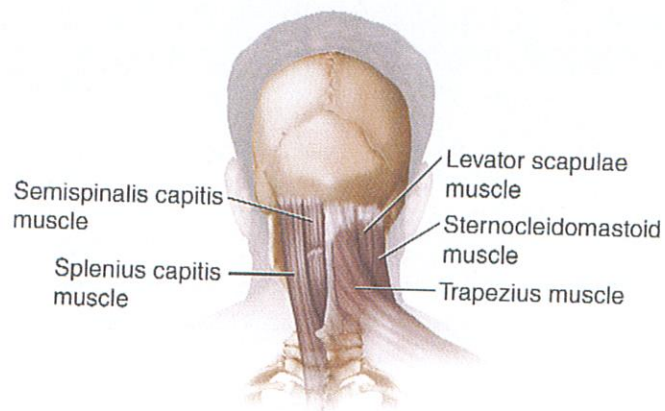
## When can I return to my sport or activity?

The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your sport or activity will be determined by how soon your neck recovers, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better.

If you participate in contact sports, it is important to rehabilitate your neck and shoulders before going back to competition. You must have full range of motion of your neck. This means you must be able to:

- turn your head fully to look over both shoulders
- extend your head backward as far as possible

## NECK STRAIN



- flex your neck forward until your chin touches your chest
- move your head in each direction so that your ear touches your shoulder

If any of these actions cause burning in your neck or shoulder, or pain or spasm in your neck or shoulder muscles, you are not yet able to return.

## How can I prevent neck strain?

Neck strain is best prevented by having strong and supple neck muscles. If you have a job that requires you to be in one position all day (for example, work at a computer all day), it is very important to take breaks and relax your neck muscles.

In many cases an injury to the neck occurs during an accident that is not preventable.

## NECK STRAIN REHABILITATION EXERCISES

Do these exercises only if you do not have pain or numbness running down your arm or into your hand. The first 4 exercises are meant to help your neck remain flexible. The last exercise (head lifts) will help you maintain or regain your range of motion.

**1. ACTIVE NECK ROTATION:** Sit in a chair, keeping your neck, shoulders, and trunk straight. First, turn your head slowly to the right. Move it gently to the point of pain. Move it back to the forward position. Relax. Then move it to the left. Repeat 10 times.

ACTIVE NECK ROTATION



**5. CHIN TUCK:** Place your fingertips on your chin and gently push your head straight back as if you are trying to make a double chin. Keep looking forward as your head moves back. Hold 5 seconds and repeat 5 times.

CHIN TUCK



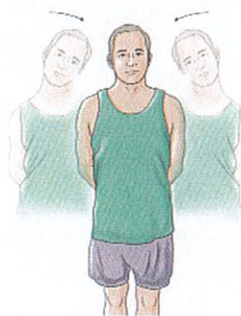
**2. ACTIVE NECK SIDEBEND:** Sit in a chair, keeping your neck, shoulders, and trunk straight. Tilt your head so that your right ear moves toward your right shoulder.

Move it to the point of pain. Then tilt your head so your left ear moves toward your left shoulder. Make sure you do not rotate your head while tilting or raise your shoulder toward your head. Repeat this exercise 10 times in each direction.



ACTIVE NECK SIDEBEND

**6. SCALENE STRETCH:** This stretches the neck muscles that attach to your ribs. Sitting in an upright position, clasp both hands behind your back, lower your left shoulder, and tilt your head toward the right. Hold this position for 15 to 30 seconds and then come back to the starting position. Lower your right shoulder and tilt your head toward the left until you feel a stretch. Hold for 15 to 30 seconds. Repeat 3 times on each side.



SCALENE STRETCH

**3. NECK FLEXION:** Sit in a chair, keeping your neck, shoulders, and trunk straight. Bend your head forward, reaching your chin toward your chest. Hold for 5 seconds. Repeat 10 times.

NECK FLEXION



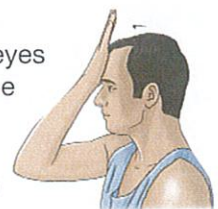
**4. NECK EXTENSION:** Sit in a chair, keeping your neck, shoulders, and trunk straight. Bring your head back so that your chin is pointing toward the ceiling. Repeat 10 times.

NECK EXTENSION



**7. ISOMETRIC NECK FLEXION:** Sit tall, eyes straight ahead, and chin level. Place your palm against your forehead and gently push your forehead into your palm. Hold for 5 seconds and release. Do 3 sets of 5.

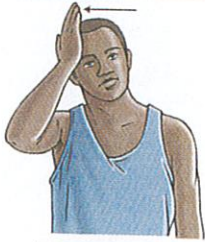
ISOMETRIC NECK FLEXION



**8. ISOMETRIC NECK EXTENSION:** Sit tall, eyes straight ahead, and chin level. Clasp your hands together and place them behind your head. Press the back of your head into your palms. Hold 5 seconds and release. Do 3 sets of 5.

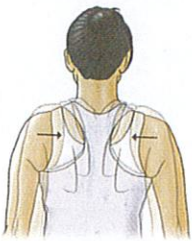


ISOMETRIC NECK EXTENSION



ISOMETRIC NECK SIDE BEND

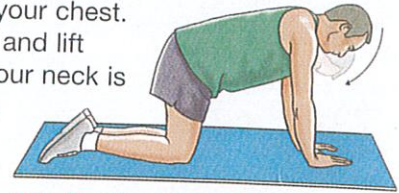
**9. ISOMETRIC NECK SIDE BEND:** Sit tall, eyes straight ahead, and chin level. Place the palm of your hand at the side of your temple and press your temple into the palm of your hand. Hold 5 seconds and release. Do 3 sets of 5 on each side.



SCAPULAR SQUEEZE

**10. SCAPULAR SQUEEZE:** While sitting or standing with your arms by your sides, squeeze your shoulder blades together and hold for 5 seconds. Do 3 sets of 10.

**11. NECK EXTENSION ON HANDS AND KNEES:** Get on your hands and knees and look down at the floor. Keep your back straight and let your head slowly drop toward your chest. Then tuck your chin and lift your head up until your neck is level with your back. Hold this position for 5 seconds. Repeat 10 times.



NECK EXTENSION ON HANDS AND KNEES

**12. HEAD LIFT:** Neck curl: Lie on your back with your knees bent and your feet flat on the floor. Tuck your chin and lift your head toward your chest, keeping your shoulders on the floor. Hold for 5 seconds. Repeat 10 times.



HEAD LIFT: NECK CURL

**13. HEAD LIFT: NECK SIDE BEND:** Lie on your right side with your right arm laying straight out. Rest your head on your arm, then lift your head slowly toward your left shoulder. Hold for 5 seconds. Repeat 10 times. Switch to your left side and repeat the exercise lifting your head toward your right shoulder.



HEAD LIFT: NECK SIDE BEND

# BRACHIAL PLEXUS INJURY (STINGER/BURNER)

## What is a stinger?

A stinger or burner is an injury to the nerves that travel from your neck and down your arm.

There are seven bones in your neck called vertebrae. The vertebrae are held together by ligaments. Your spinal cord goes from the bottom of your brain through a canal in your vertebrae down to your lower back. Nerves come off the spinal cord that make your limbs and body move and have sensation. These are called peripheral nerves. A group of peripheral nerves called the brachial plexus leaves the spinal cord and travels between the vertebrae and into the shoulder, giving your arm its ability to function. These are the nerves that are injured when you have a stinger.

## How does it occur?

A stinger is almost always seen in contact sports when the head and neck are forcibly moved or hit to one side, stretching the brachial plexus on the opposite side. Sometimes when the head and neck are forcibly pushed to one side there is compression of the nerves in the brachial plexus on the same side. The nerves become irritated as a result of being stretched or compressed.

## What are the symptoms?

A stinger usually causes intense pain from the neck down to the arm. You may feel like your arm is on fire. You may have a "pins and needles" sensation. Your arm or hand may be weak. It is possible that you may not have any symptoms after a period of rest following your injury.

## How is it diagnosed?

Your healthcare provider will ask about your symptoms and examine your head, neck, shoulder, arm, and hand. You may have a sensation of burning or tingling if he or she pushes down on your head or pushes your head to the side.

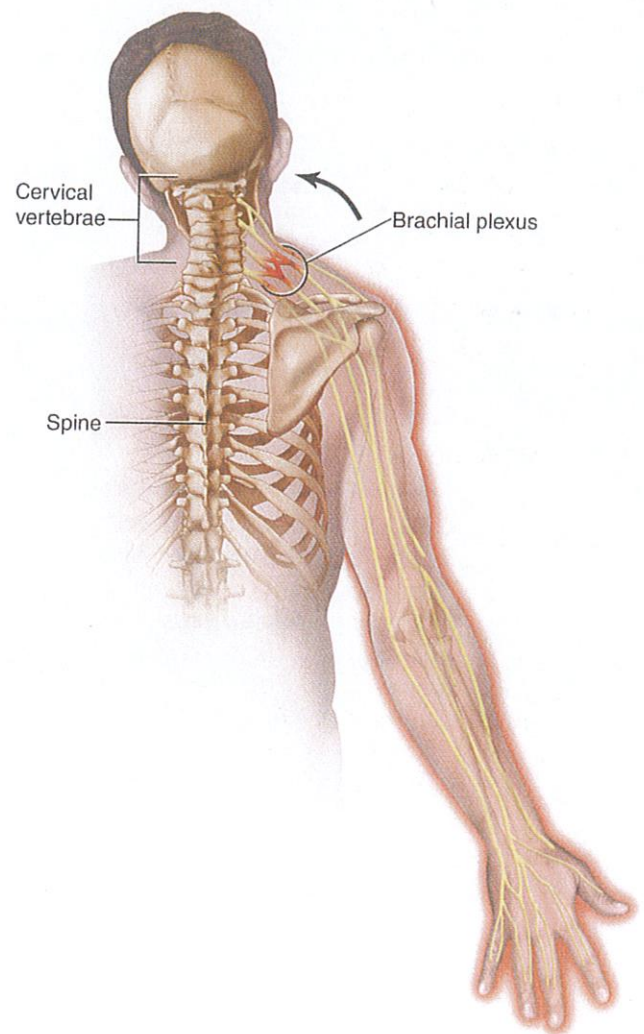
Your provider may do neck X-rays to be sure there is no damage to the vertebrae. If the injury is serious, he or she may do a CT (computerized tomography) scan or MRI (magnetic resonance imaging). Your provider may send you to a specialist for tests such as an electromyogram (EMG) or nerve conduction studies (NCS).

## How is it treated?

Treatment may include:

- resting your neck and arms until the pain and symptoms are gone
- putting an ice pack on your neck and shoulders for 20 to 30 minutes every 3 to 4 hours for 2 to 3 days or until the pain goes away
- taking an anti-inflammatory medication
- doing exercises to strengthen your neck
- chronic stiff neck muscles may be treated with heat, massage, or muscle stimulation

## BRACHIAL PLEXUS INJURY (STINGER/BURNER)



## When can I return to my sport or activity?

The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your sport or activity will be determined by how soon your nerves recover, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better.

Before you return to competition in contact sports, it is important that your neck and shoulders be healed and strong. You must have full range of

motion of your neck. This means you must be able to turn your head fully to look over both shoulders, extend your head backward as far as possible, flex your neck forward until your chin touches your chest, and move your head in each direction so that your ear touches your shoulder. If any of these actions causes burning in your neck or shoulder, you are not yet able to return.

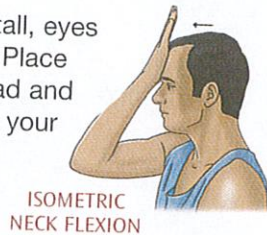
## How can I prevent a stinger?

A stinger is best prevented by keeping the muscles in your neck strong. It is important to use good technique in contact sports such as football and not to strike with your head when blocking or tackling.

# BRACHIAL PLEXUS INJURY (STINGER/BURNER) REHABILITATION EXERCISES

You can begin these exercises when moving your neck in all directions (up, down, right, left) does not cause numbness or tingling down your arm or into your hand.

**1. ISOMETRIC NECK FLEXION:** Sit tall, eyes straight ahead, and chin level. Place your palm against your forehead and gently push your forehead into your palm. Hold for 5 seconds and release. Do 3 sets of 5.



ISOMETRIC  
NECK FLEXION



ISOMETRIC NECK  
EXTENSION

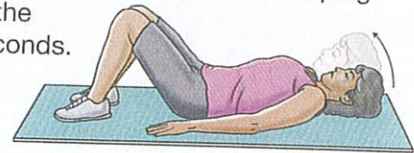
**2. ISOMETRIC NECK EXTENSION:** Sit tall, eyes straight ahead, and chin level. Clasp your hands together and place them behind your head. Press the back of your head into your palms. Hold 5 seconds and release. Do 3 sets of 5.

**3. ISOMETRIC NECK SIDE BEND:** Sit tall, eyes straight ahead, and chin level. Place the palm of your hand at the side of your temple and press your temple into the palm of your hand. Hold 5 seconds and release. Do 3 sets of 5 on each side.



ISOMETRIC NECK  
SIDE BEND

**4. HEAD LIFT: NECK CURL:** Lie on your back with your knees bent and your feet flat on the floor. Tuck your chin and lift your head toward your chest, keeping your shoulders on the floor. Hold for 5 seconds. Repeat 10 times.



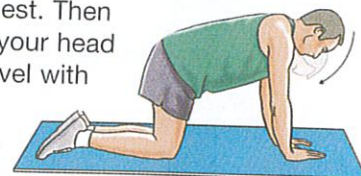
HEAD LIFT: NECK CURL

**5. HEAD LIFT: NECK SIDE BEND:** Lie on your right side with your right arm laying straight out. Rest your head on your arm, then lift your head slowly toward your left shoulder. Hold for 5 seconds. Repeat 10 times. Switch to your left side and repeat the exercise lifting your head toward your right shoulder.



HEAD LIFT: NECK SIDE BEND

**6. NECK EXTENSION ON HANDS AND KNEES:** Get on your hands and knees and look down at the floor. Keep your back straight and let your head slowly drop toward your chest. Then tuck your chin and lift your head up until your neck is level with your back. Hold this position for 5 seconds. Repeat 10 times.



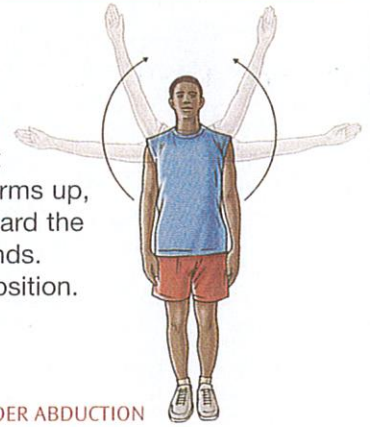
NECK EXTENSION ON HANDS AND KNEES



**7. SHOULDER SHRUG:** Stand with your head directly over your shoulders, with your spine straight. Shrug your shoulders up and then relax. Do 3 sets of 10.

SHOULDER SHRUG

**8. SHOULDER ABDUCTION:** Stand with your arms at your sides. Bring your arms up, out to the side, and toward the ceiling. Hold for 5 seconds. Return to the starting position. Repeat 10 times.



SHOULDER ABDUCTION