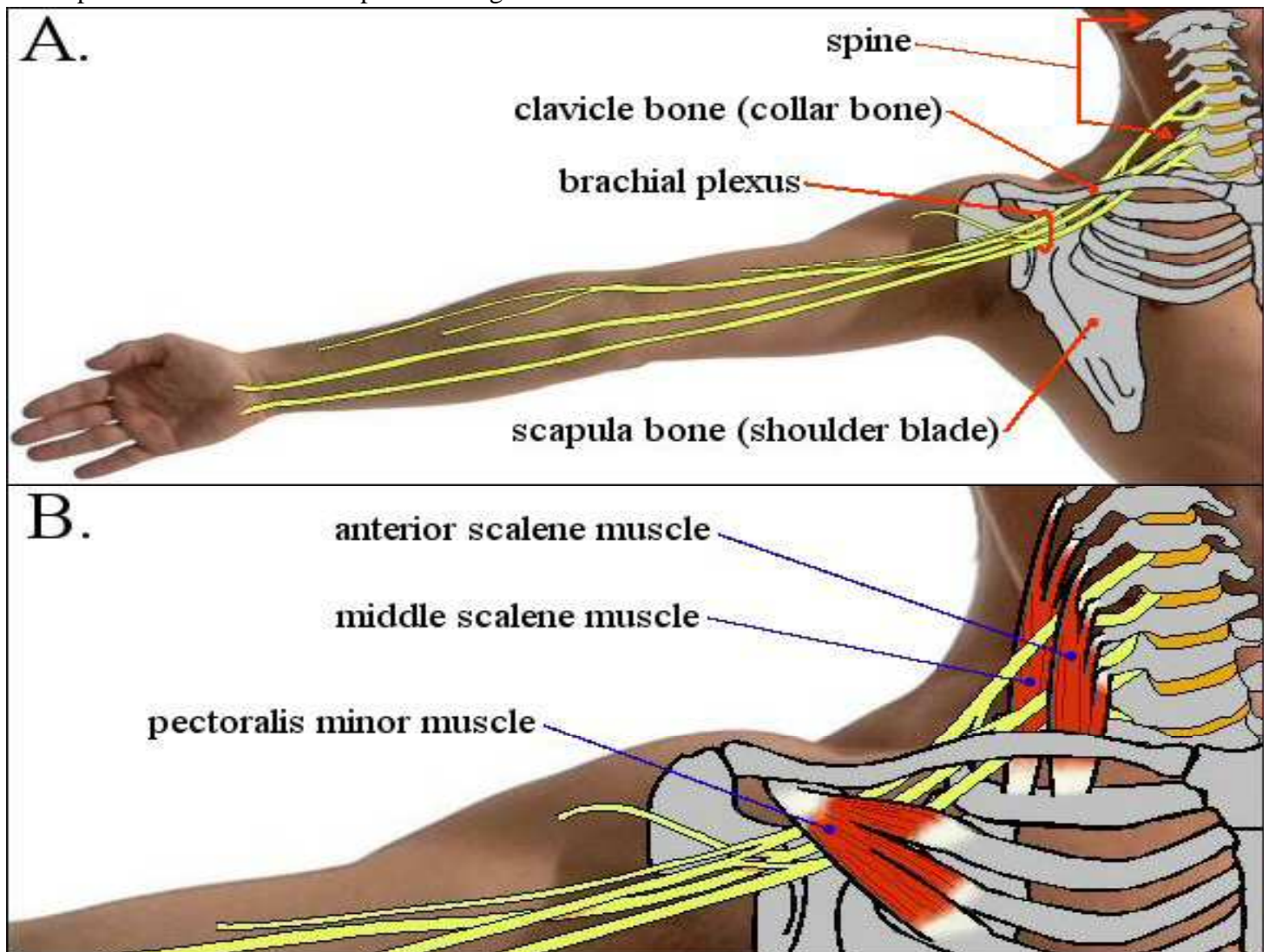


## Tingling and numbness in the hands: Thoracic Outlet Syndrome

Thoracic outlet syndrome is a common cause of pain and/or numbness and tingling in the arm and/or hand due to compression of the nerves and blood supply. It is commonly misunderstood and misdiagnosed problem because it actually encompasses a range of conditions as the nerves and vessels are able to be compressed at different locations as they travel from the neck to the shoulder. Thus evaluation and accurate diagnosis are important because treatment is different depending on the location of the problem.

### Symptoms

Symptoms that are often reported by people with thoracic outlet syndrome include pain, “heaviness” or tingling in the arms and hands. These symptoms can be on one side or both and are commonly (but not always) located in the last two fingers. The symptoms often occur with certain postures or can wake the person at night.



Anatomic Causes of Thoracic Outlet Syndrome: Figure 1A - the brachial plexus (yellow) travelling between the clavicle and first rib. Figure 1B - the brachial plexus travelling between the anterior and middle scalene muscles in the neck and under the pectoralis minor muscle in the shoulder.

## ***Anatomy and Cause***

The “thoracic outlet” refers to the space at the top of the ribcage where the nerves pass over top. These nerves are collectively called the brachial plexus and have contributions from nerves exiting the lower part of the neck and upper part of the back. Additionally these nerves are bundled with the subclavian artery which can also be affected in thoracic outlet syndrome. The nerves and artery pass between scalene muscles at the side of the neck, then between the clavicle (collar bone) and first rib before passing under the pectoralis minor muscle of the shoulder (see Figures 1A and 1B). In any of these three areas muscle tightness (as in the scalene or pectoral muscles) or altered alignment (of the neck/shoulder/collar bone) can impinge and irritate the nerves or and blood vessels leading to the symptoms of thoracic outlet syndrome. Another cause is compression from an extra rib at the bottom of the neck or fibrous attachments between this extra rib and the normal first rib.

Thoracic outlet syndrome can occur after trauma, such as with falls or accidents which injure the neck/shoulder area, but more commonly the cause is a combination of muscle imbalances, and altered posture. These changes are common in those who spend long hours doing desk work, or with certain sleeping positions, or improper workout routines.

## ***Evaluation and Diagnosis***

Much of the evaluation of thoracic outlet syndrome involves orthopedic tests to mimic the compression at the different possible sites of impingement. If these tests can reproduce the same symptoms then it suggests the exact location of the problem. For example one test, Allen’s test, involves feeling the pulse in the wrist and having the person then turn the head towards the doctor. By turning the head the anterior scalene is pushed against the brachial plexus and subclavian artery. In a normal person, this is no problem, but in someone with impingement from the anterior scalene muscle, this is meant to squeeze on the nerves and blood vessels and cause a temporary increase in the arm/hand pain. The strength of the pulse can also diminish if the compression is severe enough. Other tests are also done to rule out the numerous conditions that can mimic thoracic outlet syndrome, such as: muscle trigger points, neck injuries, carpal tunnel syndrome, pronator teres syndrome, peripheral vascular disease, lung tumours, etc.

## ***Treatment***

The treatment of thoracic outlet syndrome will be different depending on the cause but generally has three parts. The first part is for relief of symptoms. This includes determining the best positions for the patient to get relief during daytime activity and sleeping at night. A support may be needed during the day in severe cases. The second part is to begin improving flexibility and muscle balance. This can include treatment of the muscles, joints and fascia (connective tissue layers) as well as therapeutic exercises to re-balance flexibility and strength. These initial steps are often effective at providing relief and help improve sleep if symptoms are troublesome at night. Common areas of focus for these exercises are improvement of posture, and reducing tension of the neck and pectoral muscles. Finally determining a regular exercise routine and/or modifying causative activity such as workout routines (if not done so already) will help prevent re-occurrence of the problem.

*Disclaimer:* The information is provided for general knowledge only. As each person is different and other conditions cause arm and hand pain, this information may not apply to you. If you are seeking information, advice or treatment please contact the clinic for an appointment.