

Thoracic Spine

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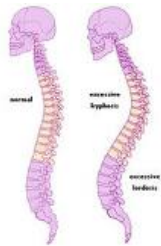
Kyphosis

A *kyphosis* is an outward or convex spinal curve. This is normal in the *thoracic* (mid-back) region. However in 20% to 40% of people, the kyphosis becomes excessive. This can lead to a number of problems.



Normal kyphosis

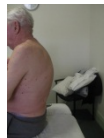
Our thoracic curve generally increases as we get older. In children the average curve is between 20° to 25°. In adults, this increases to over 30°, and females generally have a greater curve than males, particularly after age 40. In women 50-60 years old, the average kyphosis is around 40°, (and 33° for men). In women 75 to 80 years, the average is 50°. So for middle-aged people, a curve greater than 40°, and in older people a curve over 50 to 55° is considered to be excessive. This is termed *hyperkyphosis*.



Problems associated with hyperkyphosis

This has been linked with a number of problems, particularly in older people. These include:

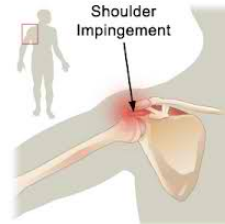
1. Difficulties with mobility – such as rising from a chair, dressing, & raising the arms.
2. Chronic pain.
3. Fractures, particularly in the spine.
4. Degenerative disc disease.
5. Respiratory & heart problems.
6. Increased risk of falls.



Spinal and other joint problems due to hyperkyphosis

Thoracic mobility greatly influences movement of the whole spine. It also affects movements in the shoulders and hips. Loss of thoracic flexibility is a common cause of low back and neck pain, the prevalence of which increase proportionately as thoracic range is lost. Common joint problems related to hyperkyphosis include:

1. Low back pain. Increased kyphosis significantly reduces available thoracic rotation range. The result is the lumbar spine & pelvis attempt to share more of the load, placing great torsional stress on the lower lumbar segments. These segments are not designed for twisting, and injury often results.
2. Neck pain & headaches. Increased kyphosis throws the head & neck into a forward posture, increasing stress on the joints of the upper neck, and on the ligaments and muscles of the upper back.
3. Shoulder pain & impingement. This becomes significantly more common. The rounded spinal shape pushes the shoulders and shoulder blades forward. This reduces the space around the joint, causing pinching of soft tissues and pressure on bones and ligaments. It also restricts shoulder movement. This can lead to *rotator cuff impingement* and tears, arthritis, and joint stiffness.
4. Mid-back pain. Chronic pain is inevitable in the mid-back region, due to joint and ligament strain, and muscular tension.
5. Rib disorders. The ribs and their joints are directly influenced by the shape of the spine. Pain and stiffness around the rib joints is one of the more common causes of chronic mid back pain.



Causes of hyperkyphosis

The cause of hyperkyphosis is not always clear. Likely reasons are:

1. Body shape and genetics. A '*kypholordotic posture*' (right) may run in the family. The development of a



scoliosis (sideways curve) is sometimes associated with increased kyphosis.

2. Poor posture. This is one of the most likely reasons for developing a hyperkyphosis. Postural disorders & thoracic stiffness may commence in childhood (see below).
3. *Scheuermann's Disease* is an adolescent, growth-associated spinal condition that usually results in an increased kyphosis. The cause is poorly understood. While there is thought to be a genetic component, it is possible that habitual poor posture may be a significant factor.
4. Spinal disorders. Various spinal disorders can lead to hyperkyphosis.
5. Osteoporosis. This can result in forward wedging of the vertebral bodies, through gradual or sudden fracturing of the vertebrae.



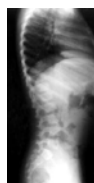
6. Degenerative disc disease. This can also be associated with an increase in spinal curves.

Assessment

Your physiotherapist can assess your spinal posture, and determine to what extent it can be corrected. They can also accurately measure the degree of curvature. This has two benefits. Firstly, they can tell you whether corrective exercise is advisable. Secondly, the results can be used to determine the rate of progression over time, or to measure the degree of improvement after corrective exercises.

Methods of assessment include:

1. Dual inclinometry. This is an accurate digital goniometer that measures two parts of the spine at once. It provides an immediate measure of the exact degree of thoracic curve. This allows the curve to be compared at rest and with corrected posture, to determine to what extent it is likely to be responsive to treatment.
2. Photography. This is another accurate and reproducible method. Measurements can be taken from the photo.
3. Flexibility tests. Your physio will measure the degree to which your spine bends and twists in all directions. This will be used to determine which movements need the most attention.
4. Xray. When available, a lateral spine Xray



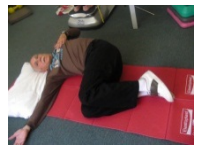
is another method to measure kyphosis. However Xray is not necessary in most cases, and unlike the above methods, is not an advisable or practical way to regularly reassess.

Prevention & Treatment

It is obviously better to avoid the development of an excessive curve if possible. Attention to posture and regular exercise for those at risk are important prevention strategies. Avoidance of high repetitive loads on a growing spine is advisable for children, particularly those with symptoms, or



with evidence of Scheuermann's Disease.



It is important for any patient prone to hyperkyphosis to work on improving & maintaining their thoracic mobility & strength. Daily exercises are recommended, and patients need to be educated about how to improve their posture in different positions, especially sitting. Thoracic & scapular strengthening, postural correction, and extension and rotation stretches are particularly effective. Hands-on treatments include mobilisation, manipulation, massage and stretches. Bracing or taping may help on a temporary basis, and can assist with educating the person how to correct their curve.

A *structural kyphosis*, or a *structural kyphoscoliosis*, are 'fixed' curves. They can be stretched, but cannot be permanently corrected. However exercises are still important. They help to minimise curve progression, to maintain flexibility, and to improve symptoms when there are associated aches and pains.

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Concord Sport & Spine Physiotherapy
202 Concord Road
Concord West, NSW 2138
Sydney, Australia.
Ph (02) 9736 1092