

The Inherently Vulnerable Areas of the Body: Reasons why the neck is inherently vulnerable

1. Cervical vertebrae & discs are **prone to degeneration** after the age of around 40 due to general wear and tear. This is known as osteoarthritis or spondylosis if the condition has proceeded beyond what can be expected for any given age. As a result:
 - There can be the growth of **bony spurs** which can inhibit free movement & also **impinge upon spinal nerves**
 - As we age the discs that separate and cushion the **joints lose fluid becoming less flexible**; we may find that degeneration leads to bone moving against bone without cushioning.
 - Due to **continued repeated pressure on particular vertebral discs** at first the inner nucleus can be torn and then it can become misshapen causing pain; eventually if all of the coverings are broken the gel-like fluid inside can **protrude or herniate** and press against spinal nerves.
 - **Symptoms** can include occasional dizziness due to a reduction in blood supply, pain in the neck, numbness and tingling in arms & hands and a loss of the natural lordosis in the cervical spine, although it may also be asymptomatic.

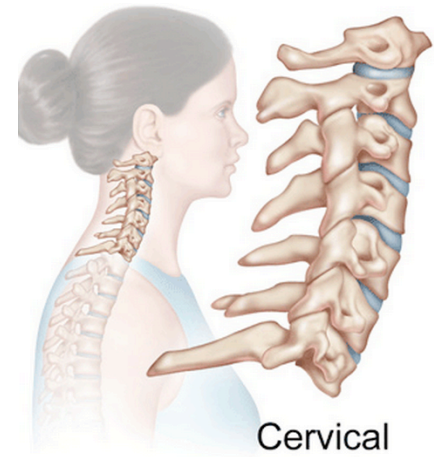


Fig 1

2. Strain or spasm to the soft muscles and ligaments can occur when the neck is forcibly pushed beyond its normal limits, especially when the weight of the body is being exerted down upon the neck.
3. If the Range of Movement (ROM) is excessive then as indicated above the cervical discs can be compressed potentially causing herniation, nerve impingement and potential occlusion of major arteries taking blood to the brain.
4. Vulnerability is exacerbated through tension when the neck & shoulders are tight, shortened or weakened through muscle fatigue.

More specifically:

5. **In Hyperextension:** when the head is lowered backwards this can be especially problematic as the head is very heavy (10 to 12lbs) and good strength is needed in the neck and shoulder muscles to lift and lower the head with integrity keeping the neck extended; there also needs to be very good proprioception i.e. an ability to feel where the body is in space. *We need to have strong muscles in the mid back, especially the lower trapezius, to help keep the shoulder blades down as well as well as keeping the sternum raised and shoulders back in external rotation to maintain length in the neck as we allow the head to mindfully drop backwards with length. [Try taking arms out to sides, palms upward facing and see how this creates this feeling of keeping the shoulderblades depressed, this is the placement we must maintain when placing the neck in hyperextension.]*
 - For asana such as virabhadrasana I (warrior I) or ustrasana (camel) we can keep the head straight i.e. in extension or if lowering the head back into hyperextension we need to retract & depress shoulderblades, externally rotate shoulders, keep sternum raised, neck long as we lower the head back and lift up.
 - In asana such as matsyasana (fish) we might keep the head to the floor, by rolling up on to the crown and then rolling the head down, rather than lowering down from an upright position or lifting the head up from the floor.

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6. **Hyperextension & Twisting:** Cervical transverse processes contain transverse foramen (holes) carrying important arteries providing blood to the brain. It is possible that the **blood** supply to the brain can be occluded, especially if we simultaneously hyperextend and twist the neck; this is particularly relevant for those who are 60+ (Lasater: Yoga Body). As such care is to be taken to keep the head parallel when hyperextending the neck.
7. **Twisting & Hyperextension:** Muscular tightness or dysfunction between C1 & C2 can mean that when twisting the neck to one side we will also have to tilt head back into slight hyperextension so we need to scan for this lifting of the chin and instruct to keep the head aligned, then if necessary we reduce the degree of rotation of the head and neck.
8. **In flexion** to forcefully flex the neck forwards, especially when the weight of body is also exerted upon the neck can be problematic causing muscle and ligament strain. Potentially this action could also cause bulging or herniation of the cervical discs on already weakened discs, also possibly creating nerve impingement or arterial occlusion. So we need to practice many inversions such with caution:
 - For sarvangasana (shoulderstand) and halasana (plough) we can use padding beneath the upper back so that the natural cervical lordosis can be maintained. We also need to ensure that we keep the neck aligned, not looking around. There also has to be very good support using the arms and hands, and ideally a student will be able to perform supported bridge before practicing these inversions, showing they can do so without compressing the neck.
9. **For flexion of arms at shoulders:** For asana such as Vrksasana (Tree Pose) with arms overhead we need to keep space around the neck through scapulae retraction and depression, and if this is not possible we can soften/bend arms. And for sirsasana (headstand) this is also true plus we must have enough strength to press down into arms to reduce pressure on the crown.
10. **Looking up at upper hand:** in poses such as trikonasana (triangle) there will be eventual strain for all students because when we are laterally flexing the neck against gravity the top side of lower cervical vertebrae are contracted and lower side of C1 & C2 are contracted so we can face forwards, but then to also look up also asks the upper side of C1 and C2 to be contracted eventually causing discomfort. Therefore students need to know that they can adjust the positioning of the head to remain comfortable, perhaps looking forwards or downwards, rather than upwards.
11. **Check that students are not tightening face and neck muscles when they are concentrating** as this can be a learned habit!

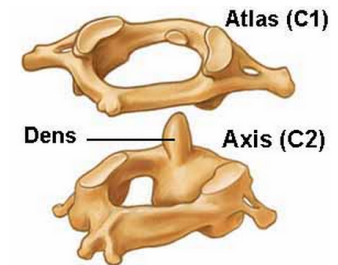


Figure 2

The good news is that mindful asana practice developed gradually over time will greatly help to maintain the health of the cervical spine and if already in a state of degeneration it will help regeneration; remember for instance that the vertebral discs do not receive as much nutrition when in a state of compression so asana can help renewed extension and healing when we practice with integrity!

Bibliography:

Lasater, Judith, Yoga Body, 2009, Rodmell Press: CA

Figure 1: <http://umm.edu/programs/spine/health/guides/cervical-spine-anatomy> accessed 1.01.18

Figure 2: <http://www.spineuniverse.com/anatomy/vertebral-column> accessed 1.01.18