

42 Pound Head

"For every inch of Forward Head Posture, it can increase the weight of the head on the spine by an additional 10 pounds."

Kapandji, Physiology of Joints, Vol. 3

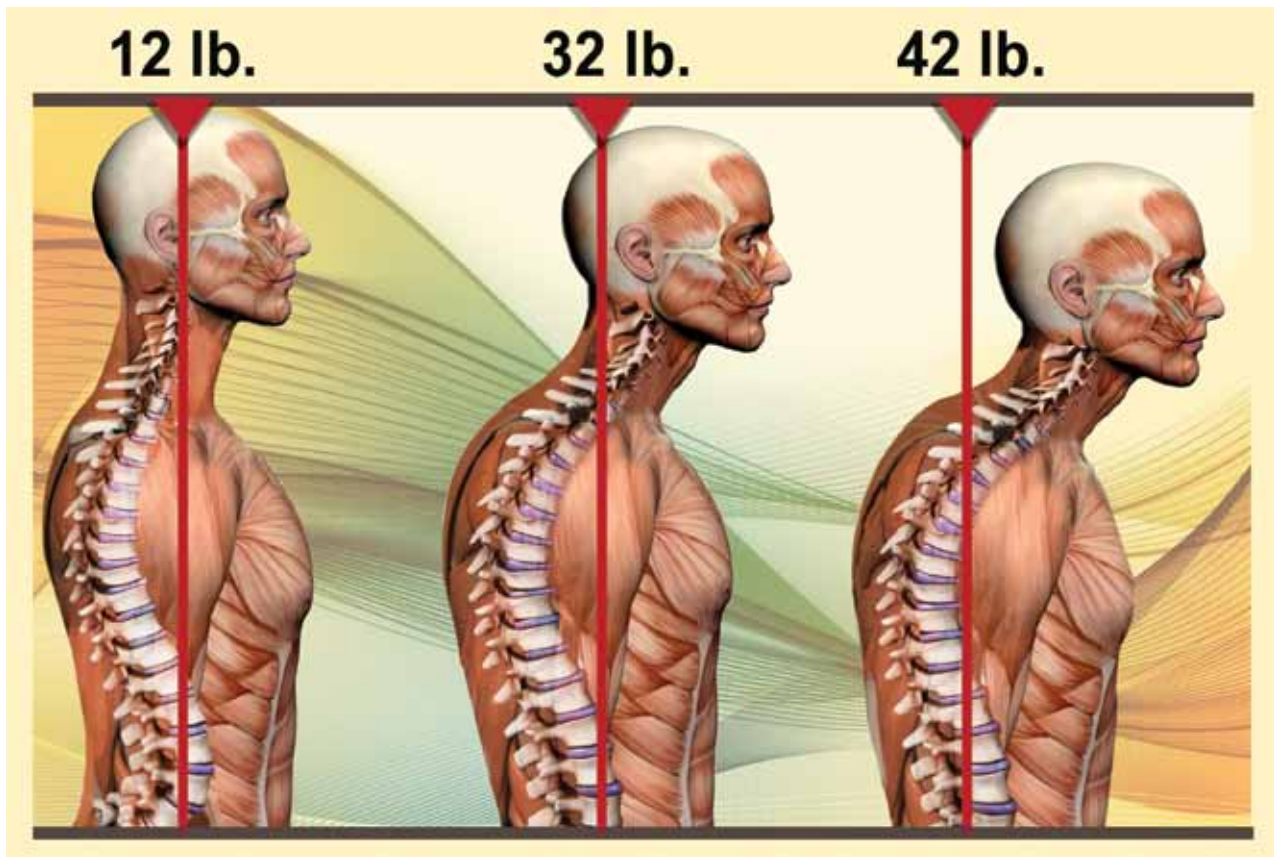


Fig. 1 - The 42 Pound Head

It's not uncommon to have clients walk into your office sporting a 12 pound head that's migrated three inches forward of their shoulders. You know prior to palpation that their cervical and capital extensors (semispinalis, splenii, longissimus and upper traps) are in a losing battle attempting to isometrically restrain 42 pounds against the unrelenting force of gravity (Fig 1).

The cervical and thoracic myofascia really take a beating from our society's addiction to prolonged sitting. It's not so bad in the early stages when muscles are only firing at about 4% of their maximum voluntary contraction ability.

But, as Sato and fellow researchers found, a negative metabolic state, i.e., reduced blood and lymph flow, triggers fatigue and neck pain when this posture is maintained for over 10 minutes.

1. Ligamentous laxity (creep) has also been linked to excessive spinal flexion from gravitational exposure.
2. Since ligaments are responsible for protecting intervertebral discs and facet joints, any disruption in integrity predisposes the neck to future injury. Once a tissue is strained, it has difficulty returning to its original length.



Rene Cailliet, M.D.

Rene Cailliet M.D., former director of the department of physical medicine and rehabilitation at the University of Southern California wrote:

- Head in forward posture can add up to thirty pounds of abnormal leverage on the cervical spine. This can pull the entire spine out of alignment.
- Forward head posture (FHP) may result in the loss of 30% of vital lung capacity. These breath-related effects are primarily due to the loss of the cervical lordosis which blocks the action of the hyoid muscles, especially the inferior hyoid responsible for helping lift the first rib during inhalation.

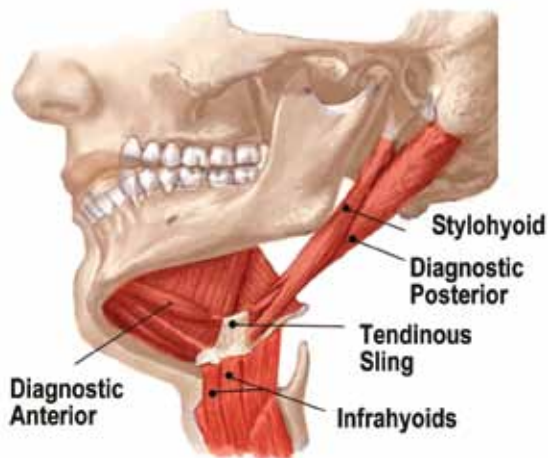
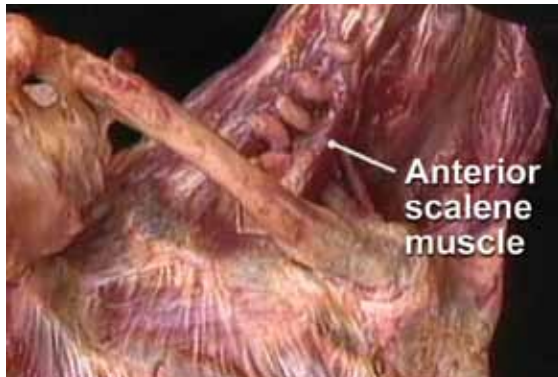


Fig. 2 - Hyoids & Anterior Scalenes

- Proper rib lifting action by the hyoids and anterior scalenes is essential for complete aeration of the lungs (Fig 2).
- The entire gastrointestinal system (particularly the large intestine) may become agitated from FHP resulting in sluggish bowel peristaltic function and evacuation.

Cailliet also states: *“Most attempts to correct posture are directed toward the spine, shoulders and pelvis. All are important, but, head position takes precedence over all others. The body follows the head. Therefore, the entire body is best aligned by first restoring proper functional alignment to the head”.*³

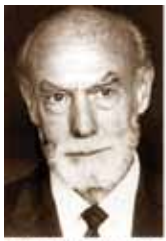
Of course, the effects of poor posture go far beyond just looking awkward. In fact, the January, 2004 issue of the American Journal of Pain Management reported on the relationship of poor posture and chronic pain conditions including low back pain, neck related headaches, and stress-related illnesses. “The extra pressure imposed on the neck from poor posture flattens the normal cervical curve resulting in abnormal strain on muscles, ligaments, fascia and bones.”⁴

Research presented at the 2009 Annual International Conference of the IEEE EMBS stated: *“Over time poor posture results in pain, muscle aches, tension and headache and can lead to long term complications such as osteoarthritis. Forward head carriage may promote accelerated aging of intervertebral joints resulting in degenerative joint disease.”*⁵ (Fig 3)

It appears posture impacts and modulates all bodily functions from breathing to hormonal production. Spinal pain, headache, mood, blood pressure, pulse and lung capacity are among the many conditions influenced by faulty posture.



Fig. 3 - Degenerative joint disease



Dr. Roger Sperry

“90% of the stimulation and nutrition to the brain is generated by the movement of the spine” Dr. Roger Sperry, (Nobel Prize Recipient for Brain Research)⁶

Additionally, Dr Roger Sperry demonstrated that 90% of the brain’s energy output is used in relating the physical body to gravity. Only 10% has to do with thinking, metabolism, and healing. Consequently, a FHP will cause the brain to rob energy from thinking, metabolism, and immune function to deal with abnormal gravity/posture relationships and processing.

The March 2000 Mayo Clinic Health Letter expounded on Sperry’s findings by reporting that prolonged FHP also leads to “myospasm, disc herniations, arthritis and pinched nerves.” Degenerative neck pain goes hand-in-hand with balance problems especially in the elderly. Sensitive cervical spine mechanoreceptors govern the body’s ability to balance and must be perfectly coordinated with the inner ear’s vestibular balance system to stabilize equilibrium in both static posture and gait. Keeping the eyes looking forward is a basic life-preserving reflex, and as such, dominates nearly all other postural considerations.

Proprioceptive signals from the first 4 cervical vertebrae are a major source of stimuli for regulating the body’s pain-controlling chemicals (endorphins). FHP dramatically reduces endorphin production by limiting the cervical spine’s range of motion. Inadequate endorphin production up-regulates the central nervous system causing non-painful sensations to be experienced as pain. Figure 4 shows a couple of good articular stretching techniques (AST) for restoring joint-play to fixated upper cervical facet joints.



Dr. Alf Breig

Dr. Alf Breig, a Swedish neurosurgeon and Nobel Prize recipient coined the termed ‘adverse neural tension’ to describe the mechanism by which loss of normal cervical lordotic curve creates dysfunction and disease.⁷

Through cadaver studies, Dr. Breig demonstrated that neck flexion could stretch the spinal cord 5-7 cm causing tensioning of the meninges. Once the ligaments have been stretched and strained from years of forward head carriage, any trauma such as whiplash, can damage the spinal cord at its firm attachments at C2-3 and the foramen magnum. (Fig 5)

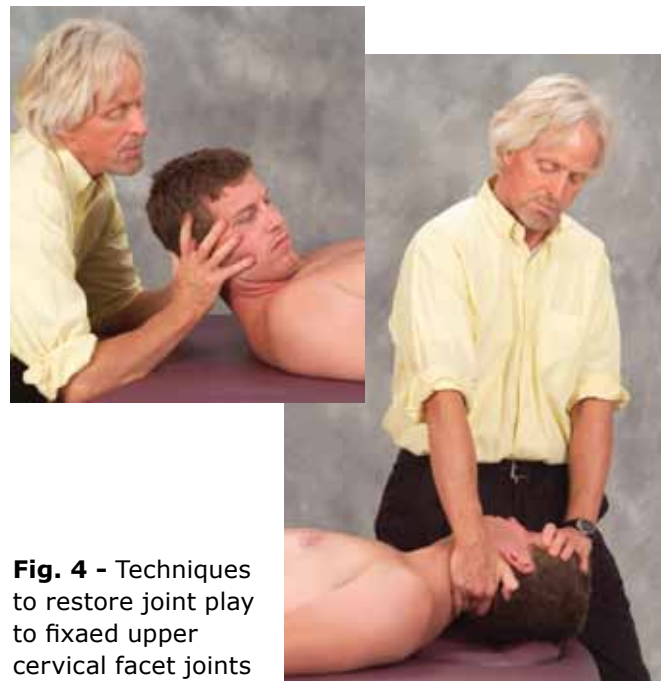


Fig. 4 - Techniques to restore joint play to fixated upper cervical facet joints



Fig. 5 - Trauma can damage the spinal cord

Identifying Common Compensatory Patterns

As discussed in previous chapters, the legendary rehab specialist Vladimir Janda, MD has helped manual therapists better understand commonly seen muscle imbalance patterns consistent with FHP. Janda's Upper Crossed Syndrome (Fig. 6) is characterized by over activity or tightness in the upper trapezius, levator, suboccipitals, sternocleidomastoids and pectoralis major and reciprocal weakness of the deep neck flexors and lower scapular stabilizers. Trained therapists visually recognize this aberrant pattern through postural and gait analysis and kinesthetically through tissue palpation and functional screen testing.

Unfortunately, as normal movement patterns are altered by persistent pain from joint fixations or muscle imbalances, new neuronal pathways are burned into the central nervous system and gradually memorized as normal (neuroplasticity).

Any deviation of normal head and neck movement alters precise firing order patterns causing the prime mover to be slow to activate. Substitution patterns develop as synergistic stabilizing muscles are recruited to do the job of the prime mover. Some believe the first step in restoring proper muscle balance is to mobilize dysfunctional joints to help reprogram these garbled neuromuscular pathways. Once normal joint play is established and muscle splinting removed, functional length/strength balance can be evaluated

and corrected using assessment methods such as Gary Gray's Functional Movement Screen (FMS) or similar 'baseline' screening methods.⁸

The following traits are often seen in those presenting with Upper Crossed Syndrome:

- Suboccipital pain syndromes
- Mouth breathing (sleep apnea)
- Difficulty swallowing
- Teeth clenching
- Face & neck pain
- Migraine headaches
- Uncoordinated gait and loss of body balance

Correction of Upper Crossed neck posture is a critical first step in stopping and possibly reversing decay, degenerative changes and pain from headaches, rib dysfunction, TMJ, and Dowager's Humps ...but it takes time and a concerted effort to repair the damage. **Box A** (home retraining exercises) offers some simple functional retraining tips that have proven helpful in reducing pain while restoring normal mobility/stability to the cervicothoracic and cervicocranial junctions.

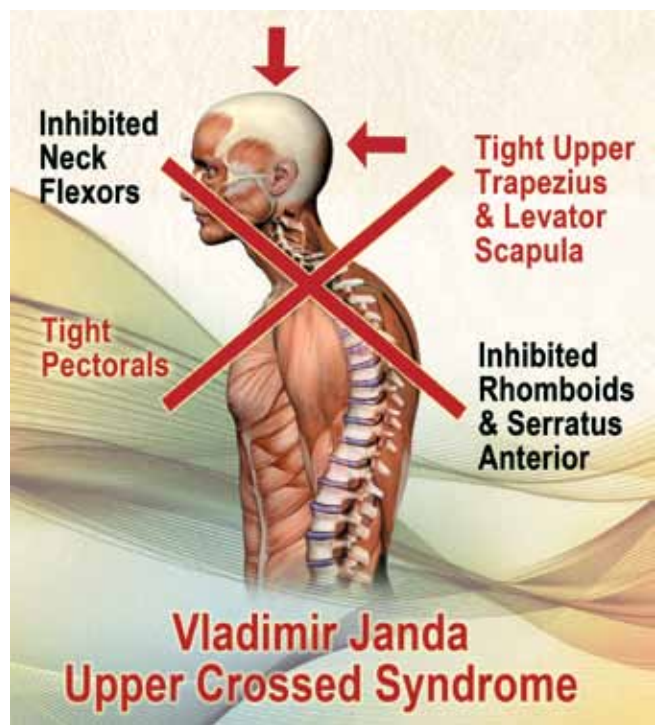


Fig. 6 - Janda's Upper Crossed Syndrome

Box A: HOME RETRAINING EXERCISES

Length/strength home retraining exercises appear to be effective in alleviating certain types of neck pain according to a 2007 article published in *The Journal of Pain*, Vol. 8, No11, 2007: 832-839. Researchers found that muscle imbalance patterns, such as Vladimir Janda's "Upper Crossed Syndrome", play a 'key' role in painful cervical spine disorders and that enhanced muscular support to pain sensitive structures may provide relief for both long term and immediate pain modulating effects. Additionally, neck exercises appear to help reverse the ill effects of poor neck posture, neck related headaches and the pain of arthritis.

Therapists must encourage clients/patients to take a pro-active approach to help improve muscle activation patterns, coordination and overall fitness. But, correction of forward head posture takes awareness, resolution of underlying causes, and repetition to make a lasting impact. I've found these five conventional home re-training tips helpful:



1. To begin re-programming the neuromyo-skeletal system, clients should perform 10 chin retractions several times throughout the day. From a slumped position, the client inhales while touching-and-tucking the chin allowing the top of the head and chest to rise.

2. Since forward head postures are commonly accompanied by rounded shoulders and exaggerated thoracic kyphosis, ask the client to focus on chest elevation and expansion. Simply retracting the chin will not correct the problem. In fact, this can cause a jamming of the lower cervical vertebrae.

3. To encourage chest elevation during the exercise, have them imagine a helium balloon attached to the pectorals helping lift

the chest wall toward the ceiling with each inhalation. Lifting the chest while the diaphragm unfolds causes a natural retraction of the shoulder girdle.

4. Coach your clients on proper ergonomics when driving, at work, and at home, i.e., computer height, sitting posture, etc. Another tip is to have the client adjust their car's rear view mirror an inch higher to remind them to sit more erect while driving.

5. Clients must avoid performing excessive trunk flexion exercises such as abdominal crunches. Overtraining global belly muscles causes adaptive myofascial shortening of the front line, disrupts core stability, perpetuates forward head postures, and prevents proper diaphragmatic breathing.

Alternative Supine Exercises

The occipitoatlantal (O-A) flexion exercise demonstrated above can initially be performed lying down to help the client grasp the specific action of ‘O-A nodding’. Tucking the chin towards the neck while slightly lifting the back of the head, should illicit a stretching sensation in the suboccipitals and a contraction of the longus capitis/colli muscles.

Breathing should be relaxed and deep. The client is taught how to engage the diaphragm, lift the chest, and tuck the chin on inhalation and relax the chin and chest on exhalation. When breathing in, the belly protrudes out and relaxes on exhalation. Have the client observe the anterior neck muscles in a mirror to be sure they do not move as they breathe. Proper diaphragmatic breathing produces a relaxing effect by lowering blood pressure, oxygenating the blood, and stimulating the parasympathetic nervous system.

Encourage clients to practice this breathing exercise while lying supine in bed at night with their hands placed on the belly gently following the inspiration/expiration cycle. Then incorporate the neck exercise.

Neck exercises should be an integral part of any home re-training program for pain relief. These exercises are easy to perform and require no special equipment. Therapists should learn to screen for functional movement patterns to develop a baseline to monitor the client’s progress. Working with a qualified trainer to assist in creating length/strength balance is also an option. The therapeutic goal is to restore natural spinal curvature and pain-free movement during normal everyday functional tasks.

Summary

Often seen as a structurally subtle body segment, the neck is burdened with the challenging task of supporting and moving the human head. Because of tension, trauma and poor postural habits inherent in today’s workplace, it comes as

no surprise that head-on-neck and neck-on-thorax disorders rank high among the most common pain generators driving people into bodywork practices. When spinal tissues are exposed to continued compression, they deform and go through a transformation that can become permanent.

Correction of Upper Crossed neck posture is key to stopping and reversing degenerative joint disease and pain from headaches, rib dysfunction, TMJ, and Dowager’s Humps. English philosopher Bertrand Russell once stated, “A physical system expresses its energy through function”. Any loss of function sets off reactions within the body’s open, dynamic system which manifests as structural abnormalities...and vice-versa. When treating functional problems such as loss of joint play, therapists must look beyond the symptoms and the artificial dividing of the body into systems and treat the whole.

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