

Pilates for Clients with Cervical spine fusions

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Abstract

The health of our spine cannot be overstated, your spinal health affects your entire body and so really your whole being. When spinal health is compromised through age, injury or structural defects it can drastically affect your quality of life.

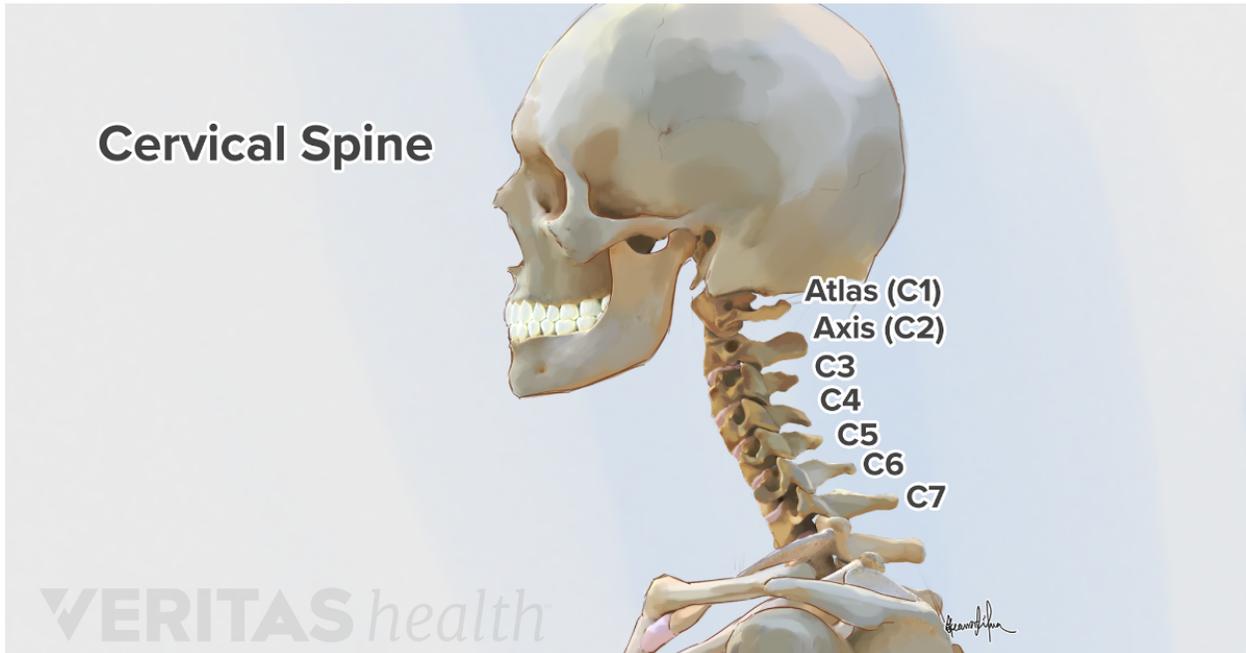
I was hit by a car at age 15, and subsequently had a cervical spine fusion, followed 7 years later by a lumbar fusion. I am now 56, very active and mostly pain free. I find that I am not the norm, however, and I have given a lot of thought as to why that is. I truly believe that maintaining functional flexibility and strength are the key. I have been a Yoga teacher and fitness professional for the better part of 25 years. I have also been an avid Pilates student for 18 years prior to taking the *Basi* training.

This paper looks at how *Basi* Pilates has helped me and 2 of my students; one who has had a cervical fusion and one who has been working hard to *not* have one.

I thank them for their feedback and time-they inspire me!

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A sagittal view of a normal cervical spine



Posterior fusion of C-2 thru T-1

History

In 1978 when I was 15 years old, I was hit by a car while crossing a crosswalk in front of the Lincoln Memorial in Washington DC. Within 6 weeks of that accident I had surgery to posteriorly fuse C4 thru T1 of my spine.

Physical therapy was not really a 'thing' at that time, and neither was yoga or Pilates. I lived in a small town 45 minutes from Seattle, where the only Physical therapists were located. The only real post-surgery advice I was given was to lay on my back for the better part of 6 weeks and then was told to get carefully on with my life. Looking back, not particularly helpful!

One of the best pieces of advice came from my high school PE teacher who was also the football coach. He suggested "weightlifting and stretching". I had been a dancer prior to my accident, and this was 1978 so I knew nothing about 'weightlifting' – I think I was the first girl to work out in the 'weight room' of my high school! I jumped in with the boy's varsity athletes and learned as much as I could about the weight room. Strength training is still always part of my fitness routine today.

Four years later as a college student I was introduced to Yoga, which became a lifelong passion for me as a student and a teacher. But maybe the first sign that Yoga was not enough was in 1984 when I began to have debilitating low back pain. Within the year, I had my second spinal fusion due to degeneration in L3 and L4.

Today this is commonly called a 'transfer of load' problem. A healthy spine should ebb and flow or move and absorb with the daily activity of a person's life. When one weak link is created, the rest of the spine must compensate and the effects are felt in a variety of ways throughout the body. In my case it was severe pain due to compression in my lumbar spine and degeneration at the age of 21. I had lost a full inch in height in 7 years following my cervical fusion.

For the 40 years that followed my accident I have lived a very healthy and active life with minimal pain and limitations. By the early 1990's I learned that to stay active for the rest of my life I would need to put even more focus on flexibility, awareness, and long-term spinal health. So 18 years ago I add Pilates to my life and seven years ago I became a dedicated *Basi* student. The combination of classical Pilates with current sports medicine and kinesiology was perfect for me. Now for the last 11 months I have been working my through the *Basi* foundation and graduate program.

Below is not only my path with cervical fusions but two of my students (who are also friends), one with a cervical fusion and one who has worked hard not to have one, who shared their stories with me. Like me, they both have had great success using *Basi* Pilates as one of the tools in their 'toolbox' to maintain spinal and overall health.

Anatomy and description

The human spine consists of 33 bones or vertebrae. They are stacked one on top of the other forming a gentle curved shaped column. The spine is broken into 5 sections; Cervical, consisting of 7 vertebrae, Thoracic the largest section consisting of 12, Lumbar which is the section of the spine which is responsible for causing pain in 80% of adults in the country at some point in their life, has 5 vertebrae. The Sacrum which is actually 5 fused vertebrae and the Coccyx which consists of 4 vertebrae which for a variety of reasons often fuse over the course of a human life.

The seven cervical spine vertebrae form the neck and are the most mobile portion of the spine. These seven vertebrae are rather thin and delicate, yet they perform the crucial role of protecting the spinal cord and supporting the head.

- *The first cervical vertebrae (C1) is known as the atlas.

- *The second cervical vertebrae (C2) is known as the axis.

- *The C7-T1 spinal segment, sometimes referred to as the cervicothoracic junction, is located at the very bottom of the neck. The connection between the neck and thoracic spine. In addition, the spine is interwoven with a complex network of muscles, ligaments and tendons. Although there is no C8 level to the cervical spine, there is a C8/T1 nerve radiculopathy (which often cause confusion when discussing the spine), which if affected or damaged can cause pain or loss of sensation in the hands. This is what happened to me and to Christine.

General Contraindications and common problems

There are a variety of common neck problems. Degeneration, Herniation, Osteoporosis, whiplash injury, stenosis and more. Some have quite specialized precautions and contraindications. Contraindications for cervical fusion are often a combination of recommendations that are specific to the individual. What was recommended for me as a teenager is different then what is recommended for me now in my fifties. Or even if I experienced the same injury as an adult. Although I still avoid repeated 'neck centric' exercises generally the contraindications for cervical fusion include:

- *avoid deep flexion, extension and rotation

- *avoid weight bearing on the cervical spine

- *use caution or refrain from exercise during periods of inflammation or pain.

Common problems can include:

- *Neck pain and stiffness, and possibly tingling in the arms and hands

- *limited range of motion, tight upper trapezius and levator scapulae

- *Poor posture -forward head and rounded shoulders etc.

Case studies- Lori, Lynn and Christine

My original injury was due to trauma -being hit by a car while crossing across walk. Seven years later, I experienced a 'transfer of load' injury and a second fusion in my low back. By the time I was 22 my normal spine which should have consisted of 24 flexible vertebrae had been reduced to 19.

After the accident I was in a hospital bed laying supine with no movement for 1 week, then a full halo neck brace for four weeks prior to my surgery. Then again post op -a full neck brace for four weeks and a soft neck brace for another 7 months. I was told repeatedly that I would never have full range of motion or activity. That was not a path I was willing to take, so at 19 I began yoga and researching anything that would give me mobility and strength and reduce my pain.

Christine is now 65, very active and a retired dentist. One of the reasons she retired early was due to numbness in her fingers, intermittent neck and shoulder pain, hand and arm tingling and weakness. She has been practicing Pilates 2 to 3 times a week (plus 1 to 2 yoga classes) for 5 years. Her overall pain is significantly reduced, the tingling and numbness is less present and her confidence in her body has increased. And she has successfully postponed a fusion of C6-C7 and bilateral carpal tunnel surgery. As a teacher this might make me nervous-the potential instability of her cervical spine. For Christine though Pilates has increased her awareness so much, as well as her overall strength and stability that I am very confident in how well she knows her body. She described Pilates as never boring and that her instructors (all *Basi* trained) all make the class appropriate to her body at the time and that her increased strength has improved her quality of life.

Lynn is 55 and a NICU nurse. Lynn was diagnosed with compression and degeneration in her cervical spine. She treated it with the usual recommendation of rest, NSAIDS and nerve blocks She works very long hours and credits Pilates for her ability to stay in her profession despite her She tried yoga and Pilates but finally after a decade of pain; neck pain, right arm pain and migraine headaches-she had a Cervical spine fusion of C5 thru C7 in 2008. She works very long hours and credits Pilates for her ability to stay in her profession despite her cervical fusion.

Lynn began taking Pilates again in 2011 then took time off in 2014. Four years later she began again, knowing that if she wanted to continue taking care of high-risk infants for another 10 years she would need to take care of her body and develop as much strength and range of motion as she could.

Basi Repertoire and conditioning goals

When you have experienced cervical spine injuries usually rest is recommended, possible immobilization, then physical therapy and of course pain meds. Once the acute condition is healed, then what?

Pilates is a long-term therapeutic approach to maintain full mobility and spinal health which is why it works so well for long term cervical spine health but the majority of people who try to jump into abdominal work with any sort of neck injury (or weakness) will tell you right off that their neck hurts. Taking breaks and building slowly and being aware of those contraindications is very important.

The goals:

- *Strengthen abdominals-without straining or re-injuring your neck.
- *Improve posture
- *Strengthen and increase flexibility in back extensors
- *Stretching tight hip extensors
- *Improve overall spinal flexibility and range of motion—the majority of re injuries after a fusion are on the surrounding discs. The disc above and below the fusion take all the work (pressure) of the fused vertebra. And warning, the greater the range of fusion the greater the pressure.

Basi conditioning program for a Cervical spine fusion client.

Roll down- this is the first spinal articulation that you do and it tells the teacher and the student so much about where you are today! It also brings you 'here into your session'. Awareness, one of the ten principals is very important to apply to your session and this is a good time to remind the client of that.

Warm up-it truly warms you up and brings your awareness to your spine. *The foundation warm up is perfect for Cervical spine clients. Pelvic curl, Spine twist supine, chest lift and chest lift with rotation.* Caution them about 'not burying their head' and not pulling on their head/neck in the chest lift and chest lift with rotation.

Foot work- Foot work helps to identify imbalances and compensations that are happening in your body and ultimately correct them. Warm up your legs and find and be aware of **pelvic lumbar stabilization**, which is very important for cervical spine clients. **Parallel heels, toes, V position toes, Open V heels, toes, calf raises, prances. Single leg heels and toes.**

Abdominal work – helps to develop abdominal strength and awareness which is vital to a cervical spine client but needs to be practiced carefully so you don't aggravate the neck. **Hundred prep** is great for beginners.

Hip work-- develop strength and control of your hip extensors and adductors. And when you have a tight spine it feels great! **Frog, extended frog, circles down, up and openings.**

Spinal articulation-*Bottom lift and bottom lift with extension.* (obviously after 10 sessions) Be sure to remind clients to have the weight on their shoulders and not their neck.

Stretches- *Pole Series, Shoulder stretch, overhead stretch, side stretch, spine twist* Doing this sitting on a fitness ball has the added benefit of increased core stability and challenging balance. And it's a great way to bring awareness to Kyphosis which is so common today.

Full body integration 1 (F/I) *Upstretch 1 and Elephant* strengthening your abdominals and back extensors plus the added benefit of the hamstring stretch makes this perfect for cervical spine health.

Arm work- *Arms sitting series.* Although arm work and strength is the goal here the added bonus is the continual postural emphasis.

Full body integration 2 Very few of my cervical spine clients can do Advanced work so this is really a 2nd Full body Integration if time allows not a I/A. ***Reverse knee stretch*** – great abdominal work and for emphasizing hip disassociation

Leg work (on the Wunda chair) *Leg press standing* great for hamstring strength and for practicing good posture and balance.

Lateral Flexion and rotation—*Mermaid* strengthen obliques plus it feels great.

Back extension- strengthening back extensors carefully of course. ***Breaststroke prep*** for new clients with cervical spine issues but Christine, Lynn and I all practice ***Pulling straps 1 and 2***

Ending roll down—final spinal stretch which always feels great.

Conclusion

When I asked Lynn and Christine if Pilates had affected their overall quality of life in anyway, they both gave a resounding YES! Christine said, “absolutely for the better” and Lynn said “absolutely, Pilates has improved my quality of life”. I would have to completely agree.

They both added that one of their favorite things about Pilates was it gave them a sense of joy and accomplishment. Which is an important aspect of overall health that Joseph Pilates referred to when he said in the *'Return to life through Contrology'* that “Physical fitness is the first requisite of happiness”. Physical health affects everything in our life. If we feel strong and comfortable in our body it will translate into how we interact with others, how we sleep, and what we do or don't do every day.

At 56 years old I am physically stronger and healthier than I was at 35 years old and I have to add I have more confidence and less pain. There is no doubt in my mind that applying the 10 principals (Awareness, Balance, Breath, Concentration, Center, Control, Efficiency, Flow, Precision and Harmony) to not only my Pilates practice but my life has truly helped me too not only age gracefully but to age with strength, flexibility and confidence.

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