SPINE ISSUES AND THE AGING POPULATION:
HOW PILATES CAN REDUCE THE PAIN ASSOCIATED WITH LUMBAR SPINAL
STENOSIS, SCOLIOSIS AND SCIATICA

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ABSTRACT

The elderly population have more than age in common. They suffer from debilitating spine issues and pain; common issues are Lumbar Spinal Stenosis, which may lead to surgery, called a Laminectomy. The Scoliosis they may have been diagnosed with as a child, will begin to show signs or worsen; Sciatica pain becomes a part of daily life. These issues are in part genetic, but also part of their history. Manual labour with long hours of standing on cement floors using improper body mechanics, lack of body awareness or simply carrying their children, have broken down their bodies. The cycle of doctor visits, pain medications and being sedentary to relieve pain begins or accelerates. The sedentary life actually increasing pain, depression and muscle atrophy, loss of range of motion and further spine issues. Through a committed, consistent Pilates practice, the elderly with spine issues can enjoy lives with less pain, greater functional strength, balance and independence; reversing the cycle of pain, doctor visits and pills.
Anatomical Description of Lower Lumbar Region of Spine with Stenosis, Laminectomy Procedure, Scoliosis and Sciatica

The spine is made up of 33 bones, called vertebra. Following is a description of a healthy spine, "Each vertebra consists of two main parts, which are the body (anterior) and the vertebral arch (posterior). The vertebral arch has many parts, and is connected to the vertebra body by two pedicles. Two lamina unite posteriorly to form a spinous process. The thickened junctions between the pedicles and laminae have superior and inferior cartilaginous articular facets and a laterally-projecting transverse process. The opening between the body and the arch is called the vertebral foremen. As foramina of many vertebrae are lined up, they form the vertebral canal through which the spinal cord passes."[1] In a spine that has stenosis, pressure is placed on the spinal cord because of the narrowing of the openings, called the neural foramina, where the spinal nerves leave the spinal column, (NCBI, National Library of Medicine). Spinal stenosis is painful and people suffering with spinal stenosis may have leg pain, which limits their mobility. They may experience numbing, tingling or a burning feeling, which radiates throughout the lower extremities and might lose bladder or bowel control. At this point, spine surgery known as a Laminectomy is performed to remove the lamina, which helps to take pressure off the spinal nerves or spinal cord. The surgery opens up the canal and allows the nerves more room.
Scoliosis, is an abnormal curving of the spine, as defined by the National Scoliosis Research Society website, "..childhood onset with degeneration over the years due to work, aggravated by spinal stenosis..."
Add to this mix Sciatica pain. The NCBI states that... "[sciatica] is caused by injury to or pressure on the sciatic nerve. Sciatica is a symptom of another medical problem and not on its own."
The lumbar region of the spine (L4 & L5 specifically), is a compromised area because of how the spine attaches to the sacrum at (S1) and the spine's natural tendency to move forward. With the addition of other spinal issues, we can see why someone would want to be sedentary, take a pill, have cortisone shots or even surgery, just so they can get rid of the pain. Shots and surgery are not guaranteed to work and pain pills can be addictive to an already fragile system.

INTRODUCTION

The elderly population, those 65 years of age and up, "is globally the largest and fastest growing portion of the population", according to Sheri Long, a BASI Instructor, in a recent conversation. There are a multitude of the older population that live active lifestyles, take great interest in their health and nutrition and try to do the "right thing" when it comes to aging gracefully. However, according to statistics from the American Academy of Ortheopaedic Surgeons website, 8%-11% of the aging population has Lumbar Spinal Stenosis. They expect 2.4 million people to have this painful condition by 2021 and those figures are only for America (Dec.2013, Vol.7: Nov.2012). No one should have to live with the painful, snowball effect of spinal issues. The LSS exacerbates the scoliosis that was diagnosed in childhood, which has become more pronounced. Scoliosis is causing pressure on the internal organs and sciatica pain worsens because of both LSS and scoliosis. The Laminectomy to help fix LSS has caused other issues. There is another option for dealing with this condition and strengthening the lower lumbar region that even the older, aging population can participate in with great success, Pilates!
CASE STUDY

Jewell is a 78 year-old female, a fun, good-natured lady, whose body is probably ten years older than her brain. She has raised six children and worked jobs that required her to stand 12 or more hours a day on concrete floors. She has been a barmaid, waitress and her physically least demanding job was as a receptionist. She prefers playing dominoes or cards to exercising. Physical therapy has been unsuccessful, as the therapist "forces " her body to move.

Jewell has spinal stenosis with Laminectomy at L4, L5, and S1 in 2012. Her Scoliosis was diagnosed as a child, but through the years, as her physical health has declined, the Scoliosis has become more pronounced. She has developed a lateral tilt to the left and Sciatica to round it all out. Dementia is also an issue, but is unmedicated currently. She is on a host of medicines including those for Blood Pressure, pain meds, bladder control and blood thinners. Surprisingly, she has good bone density with no signs of osteoporosis and her doctor feels she is in "good health" and encourages exercise to help with her balance and strength. We will not be doing exercises that need bottom loaded equipment (Foot Work on Cadillac, for example), because of her spine issues.

Also, she has stated that anything in a prone position causes her pain and is uncomfortable. Most likely this is because of the Laminectomy and she is not engaging her abdominals. As she achieves more strength and body awareness, this may be a position she could try. She has a little depression, due in part to pain, but also from some of the medicines and Dementia. Jewell agreed to our Pilates sessions, twice a week for an hour each visit for the past ten weeks. Her goals are to have less pain and "a little more strength". Personally, I would like to see her increase her range of motion,
achieve more functional strength and balance, as she has fallen several times in recent weeks.

CONDITIONING PROGRAM FOR JEWELL

Since Jewell has many spinal issues and several years without physical activity, we work slowly. We are using the Cadillac table for her Mat Work, as it is much easier and more comfortable for her. The Warm Up period requires a bit more time and more focus on breathing to help center her and get her focused on the session. Warm Up Block consists of breath work, seated on the side edge of the Cadillac, working on trying to engage muscles that have been unused for so long. I assist her to lying in a supine position, knees bent and feet on mat. A small pillow is placed under her left hip to help with symmetry. Pelvic Tilt, is the first exercise and I have her move in a biased posterior position in addition to laterally left and right, to begin relaxing her lumbar and to help her find her neutral spine. Pelvic Curl, is next and I try to encourage flexion for her versus extension. Her Pelvic Curl is a small move, however, I have noticed improvement and it helps with Sciatica pain. Spine twist is also done with both knees bent and feet flat. I then move her into chest lift to work on abdominal strength and pelvic lumbar stability. The abdominal and back extensor area on Jewell is extremely weak and tight, but as strength is gained her back extensors will also become stronger. It is a struggle for her to make it through five repetitions of the aforementioned movements. Cat Stretch is one of her favourite exercises and she does several repetitions before moving onto the Foot Work Block.

Working with the BASI Block System, the first six sessions of her Foot Work Block, was first done facing a mirrored wall, arms shoulder width apart and palms flat on the glass. It
also sneaks in extra Arm Work. I started her at five repetitions of each move. To keep things interesting, a chair was used for support and also a barre. Correct posture, alignment, and breathing are necessary in the standing Foot Work, again sneaking in "extra" work for her and having her stand is helps build leg strength. The repertoire she practiced was Parallel Heel, Parallel Toes, V-toes, Open V-heels, Open V-toes, Calf Raises, Prances, Single Leg Heel and Single Leg Toes, five repetitions of each move. She is typically ready for a rest at this point so I take her back to the Cadillac and help her into a supine position, with a pillow under the left hip and have her do Single Leg Lift and Leg Changes. She does not realize she has been moving the entire time. While on the Cadillac, Hip Work Block, Fundamental exercises, Frog, Circles Down/Circles Up, and Openings are done without springs or straps, again about five repetitions of each are done. The repetitions are increased at each session and she has gained enough strength to use light springs with straps.

There is no Spinal Articulation until Session 11, at which time I thought she may have sufficient strength to try a Roll Up using the Roll Up Bar on the Cadillac. She needs to be stronger in the abdominals, but we will keep working with it. For Stretches Block, she does standing lunge at the wall or at the Ladder Barrel. She needs a lot of stretching especially, hip flexors and hamstrings. Since there is no Full Body Integration until Session 11, I use the time to her prepare for her Arm Work with the Pole Stretch Series, however, the Overhead Stretch she cannot put the pole much past the back of her neck. She has done the Pole Series using Therabands and straps. We move to the Avalon for the Arm Work Block, Supine Arm Series, Extension, Adduction, Circles Up/Circles Down, and Triceps. She only does three repetitions of each. There is no Full Body Integration II until Session 21. Leg Work Block, we go to the Cadillac once again. Side Lying Gluteals
Series, without weights to begin, Side Leg Lift, Forward and Lift, Forward and Drops about three to five repetitions of each. I add the adductor squeeze using a ball or a pillow. Lateral Flexion and Rotation, for the Scoliosis, consists of Side Lifts. I have her do extra on her left side to help build the strength on that side. Back Extension Block is done standing at the wall and I have her practice Basic Back Extension, trying to focus on the thoracic extension.

I reevaluate Jewell on a regular basis, our sessions typically go well. She has built strength and flexibility. Her mood is consistently happier. She does not need to spend as much time warming up with breathing exercises and I have recently added the Hundred Prep and Leg Circles to her Warm Up routine. She comes up higher in her Pelvic Curl and is strong enough to get onto the Reformer, with assistance, to practice Foot Work. She can do Arm Work and Hip Work there as well and modifications are made as needed. Jewell has even done the Spine Stretch (Mat), Sitting Forward and Roll Up using the Roll Up Bar on the Cadillac and Swimming in quadruped position. The Avalon is one of her favourite pieces of equipment. She can do the Hundred Prep, Mini-Roll up and Mini-Roll Up Oblique. She has even been able to get down to the floor and back up again with little assistance and has practiced mat repertoire, which we do in an extra mini-session each week that is thirty minutes in length. Jewell has met and exceeded her goals of less pain and a "little strength". Her posture is much better and she is less laterally left tilting from the Scoliosis. The Sciatica pain is no longer a daily complaint and the LSS with Laminectomy is much less painful. Her balance is good and her gait more steady. Our sessions may not progress as quickly as with a younger, more fit client, but Pilates is an evolving practice and we have accomplished a lot so far.
I am learning what the older client can do and is willing to do far exceeds what I thought
what they could do.

CONCLUSION

Lumbar Spinal Stenosis (with Laminectomy), Scoliosis and Sciatica pain are all too
common spinal issues plaguing the aging and elderly population. These conditions can
be debilitating both physically and mentally. However, by using the BASI Block System
and the flexibility allowed within system, we, as teachers to make a more thoughtful and
tailored approach to what our clients truly need. The client, especially the aging client,
can feel empowered as their bodies perform the exercises and they are able to see their
progression from one session to the next session. Through a consistent, committed
Pilates practice, the aging client suffering from spinal issues are given another
alternative to shots, pills or surgery. An alternative that is guaranteed to last and to get
better as long as they can practice. Allowing them to enjoy healthier, more fit, balanced,
and independent living in their golden years.
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