

Wobble Chair™

Wobble Chair

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Loading and Unloading Exercises

Spinal rehabilitative procedures are the necessary first step for spinal corrective procedures. Loading and unloading cycles (hysteresis) are the important first actions of all Pettibon correction and rehabilitation procedures.

The avascular disc ligaments and tendons are rehydrated and nourished, and metabolic wastes are eliminated by loading and unloading cycles. "During cyclic testing of discs, ligaments and tendons, wherein loads are applied and released at specific intervals, the amount of permanent (non-recoverable) deformation is progressively greater with every loading cycle."^{7,10}

"Permanent, non-recoverable deformity" means that the visco-elastic properties of discs, ligaments, and tendons that hold the vertebral units out of their normal position are progressively less resistant to spinal corrective mobilization. They become less resistant with each repetition of the loading and unloading cycle, up to the point of safety (the linear region). The safe region is up to 1000 cycles.

Up to 95% of the force needed to mobilize the spine is reduced by repetitive cycles:

- Up to 60 repetitions, using the Repetitive Cervical Traction™, are performed preparatory to mobilization of the neck and upper thoracic spine.
- Up to 120 repetitions, using the Wobble Chair™, are performed preparatory to mobilizing of the lumbar spine and pelvis.

Repetitive loading and unloading cycles produce the following:⁴

- Rehydration of the disc and increased disc height
- Increased disc, ligament, and tendon strength
- Decreased potential for injury or severity of injury from sudden applied forces
- Lubrication for spinal joints and nourishment for their cartilage
- Prevention of adhesions during healing, and improved joint integrity of healed joints
- Development of the 'core' basis for further strength, endurance, and agility training

Rehabilitative or therapeutic exercise is an extremely valuable aid to the doctor in both acute and chronic musculoskeletal conditions. By proper utilization, the doctor can capably manage and rehabilitate musculoskeletal complaints. Therapeutic exercises have been defined as, "Motion of the body or its parts to relieve symptoms or to improve function."⁵

"The patient that participates in a well devised, scientifically based and properly instructed exercise program should benefit in at least four areas:

1. Enhanced musculoskeletal performance
2. Decreased risk of injury
3. Decreased severity should an injury occur
4. Accelerated rehabilitation and return to activity after an injury"²

By the time a person is 12 years old, the spinal discs, ligaments, and cartilage no longer have a direct blood supply for the nourishment and elimination of tissue cell wastes. These tissues are then referred to as avascular. Avascular tissues require nourishment and waste elimination to function normally, and to repair and regenerate as they did when they were vascular. Motion is now required to pump nourishing fluids into and waste products out of avascular tissues such as the spinal discs and ligaments.

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The first reaction to an injury is splinting by the muscle to protect the injured part. Splinting, however, prevents the motion necessary for nourishment, waste elimination, repair, and healing of the injured tissues. Motion is essential for a strong, pain-free spine. Traction and compressive motion rehabilitation should be started as soon as practical.

Bernini, Wiesel, and Rothman explain that twice-daily, full range of motion, called “osmosis and imbibition,” is absolutely essential for daily metabolic interchange. This is described as nutrition intake and elimination of waste products in order to maintain healthy, well-hydrated spinal discs, ligaments, and tendons.¹

In contrast, they have found that up to 500 days is required for metabolic interchange by sedentary patients and patients who do not engage in daily full range spinal workouts. This full range is necessary to mix the glucosamine, chondroitin sulfate and proteoglycan aggregates that nourish the discs.¹

Often patients are prescribed vitamins and minerals by well-meaning clinicians. However, these supplements can do little or nothing for the patient unless sufficient loading and unloading exercises are performed to the extent that the avascular discs have a complete metabolic interchange. In other words, the discs absorb the supplements from the surrounding fluids during contraction and expel tissue cell waste during compression.

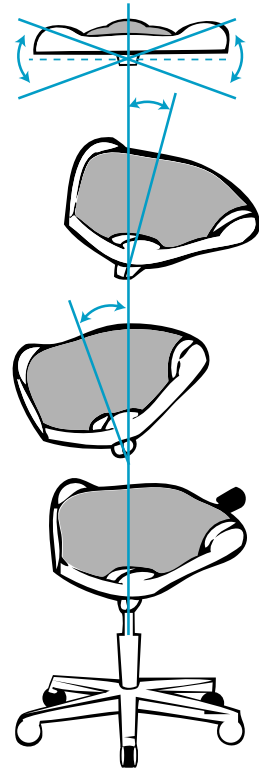
The following are researched conclusions regarding the repair and healing of avascular tissues—such as spinal discs and ligaments—during the healing of mobile tissues:

- Immobility is harmful.²
- Drs. Salter and Oglive-Harris presented evidence that continuous passive motion caused healing of interarticular fractures. In their experiments they found that chondrogenesis of bone and cartilage was produced by intermittent compression and traction.⁹
- Experiments were conducted using loading and unloading cycles initiated by traction and compression of the spine. These experiments demonstrated a repair mechanism in the spinal disc which is mechanical in nature. Long-axis loading and unloading cycles of the injured discs of the spine caused a remarkable “self-healing” time. During the third cycle, the motion segment revealed near-“intact” behavior again, independent of the type of injury.^{6,8}
- A defect in the annular ring alters the mechanical characteristics of a disc. Loading and unloading traction cycles cause an adjustment that restores near-perfect disc function.⁶
- Experiments performed to determine the physical properties of the intervertebral discs found no herniation of the nucleus pulposus due to very high compressive loading. An incision was then made in the annulus fibers all the way to the center, followed by compressive loading. There was very little change in the elastic properties of the disc and definitely no herniation.¹¹
- A number of tests proved that degenerated discs are actually stronger than normal discs when subjected to compressive loading and traction unloading cycles.³

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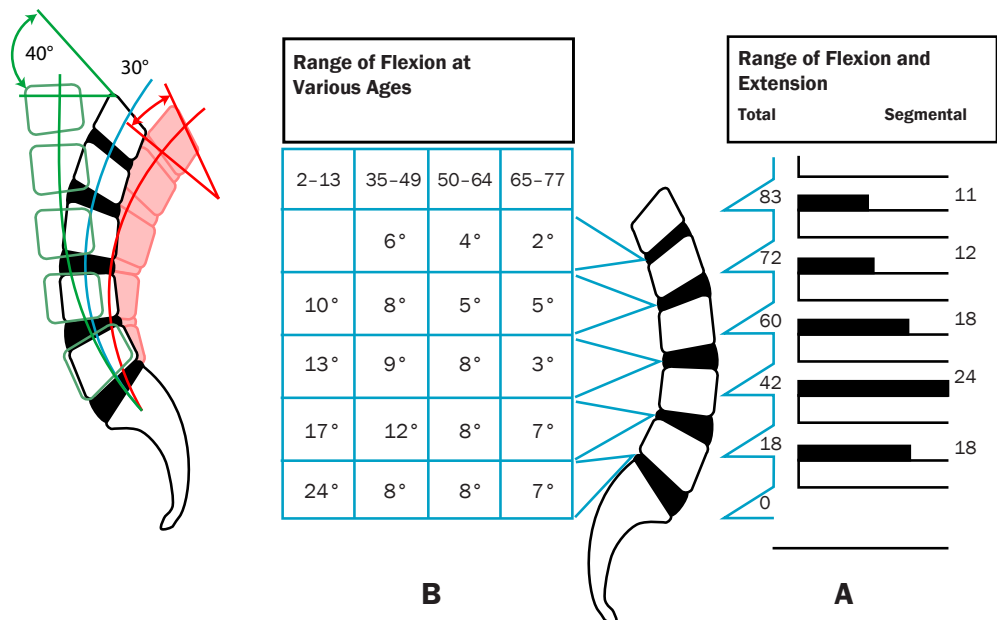
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Figure 1



Wobble Chair Range of Motion

Figure 2



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Figure 3

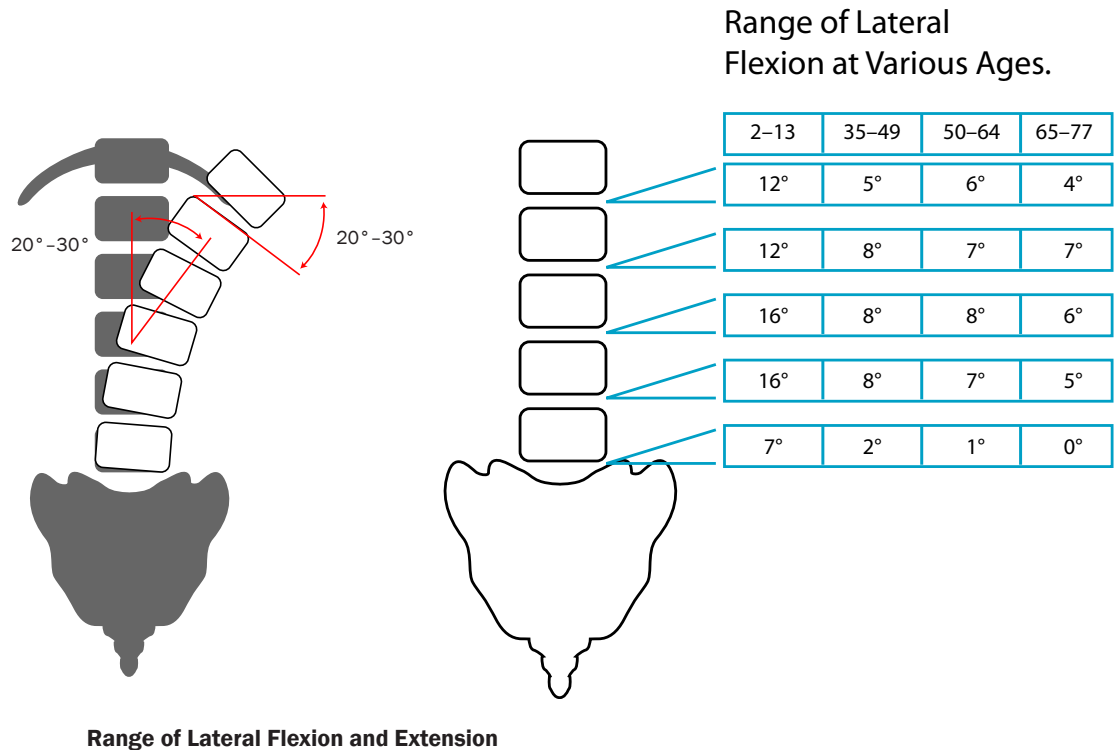
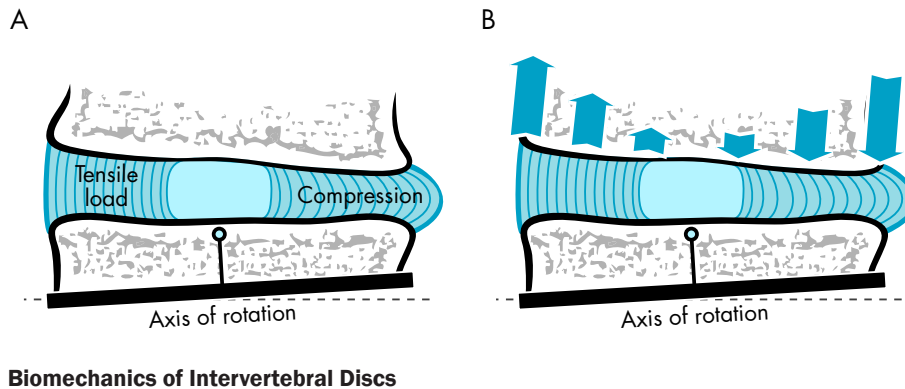


Figure 4



The intervertebral disc stresses with bending (flexing, extending, and lateral motion). On one side, the annulus is subjected to compression while the other side is put under tensile load. The instantaneous axis of rotation separates the two zones. On the compression side the disc bulges, while it contracts on the tension side. The stresses vary in magnitude from maximum in the outer laminae of the annulus to zero at the instantaneous axis of rotation.

The Wobble Chair produces loading and unloading cycles for spinal rehabilitation and prepares the spine to be mobilized. While the loading and unloading cycles of the Repetitive Cervical Traction lower the neck and upper back's resistance to correction, the Wobble Chair reduces the lower body's (thoracic, lumbar, and sacral) resistance.

Wobble Chair exercises begin with stretching maneuvers. Stretching, followed by full range exercises, cause the hydro-gel (Jell-O like fluid) of the discs' resting nuclei to be converted to a hydro-sol (water-

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like solution for ease of imbibing of fluids). The hydro-sol form allows for fluid movement through the disc wall and the vertebral end plates. This specific-motion exercise produces multiple functions: Rehydration and nutrition delivery to and waste elimination from the discs, ligaments, cartilages, and joints. In addition, these same motions aid in pumping, circulating, and maintaining the pressure of cerebrospinal fluid. Full diaphragmatic breathing enhances the exercise action.

Stretching procedures always precede 5 to 10 minutes of exercises, which complete the disc nucleus rehabilitation. The exercise is performed by the movement of the pelvis through full sideways figure-8 motions. After 20 to 30 full figure-8 motions have been completed, the patient is instructed to add full diaphragm inhalation during each right and each left forward-lateral pelvic figure-8 motion and hold it for a one-two count. The breath is completely exhaled with each right and each left backward motion of the pelvis during the exercises.

Stretching and exercise time is gradually increased until at least 120 compressive loading and traction unloading lateral figure-8 cycles are performed every exercise session.

To be effective, the pivoting mechanism for the exercise chair can be no longer than a lumbar disc nucleus. Therefore, the use of an exercise ball has not proven effective.

The timing of this exercise is important. Best results are obtained when the stretching and exercises are performed just after rising in the morning and just before bed at night. Evening exercises may be followed by spinal molding procedures, phase #1, #2, and/or #3. Some soreness and stiffness is anticipated. If it persists, reduce the exercise time and amount.

Wobble Chair Stretching and Warm-up Instructions

1. Instruct the patient to drink eight ounces of water before and eight ounces after each workout.
2. Erect a mirror so that the patient can see him/herself performing the warmups and the exercises. The mirror helps ensure the chest is held immobile during exercise.
3. Sit on the chair's triangular-shaped seat with the point of the triangle facing forward.
4. Press down on the lever under the seat to adjust the height to fit. Raise or lower the seat until the upper thigh is about parallel to the floor and legs are about 70 to 90 degrees apart. The portable model has no lever. Its height is adjusted by placing it on stairs or a stool. If your chair has arms, set the arm height and width so that the chest can be held relatively immobile.
5. Grasp the arms of the chair with both hands.
6. Keep the chest relatively immobile, flex the stomach, pelvis, and low back completely forward, then completely extend backward. Inhale deeply on forward flexion and exhale completely on backward extension.
7. Continue until comfortable with the low back flexion and extension stretching, then shift to right and left lateral flexion of the low back and pelvis. Continue side-to-side flexion until comfortable.
8. Rotate the pelvis in a clockwise direction as fully extended as possible, then reverse the rotation to counter-clockwise until all movements are comfortable.
9. Instruct the patient to identify and report stiff, sore, and painful areas.

After the muscles are stretched and relaxed, the muscles will now allow the discs and ligaments (white tissues) to be moved through full ranges of motion. When this state of full range of motion is achieved, the white tissue loading and unloading cycle exercises can be performed so they can produce the desired effects.

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Basic Wobble Chair Exercises

1. Inhale deeply. Shift the pelvis and stomach toward the right knee by contracting the left-side low back muscles.
2. Shift the pelvis straight back as far as possible from the right knee by contracting the left-side stomach muscles. Exhale forcefully.
3. Inhale deeply. Shift the pelvis and stomach toward the left knee by contracting the right-side low back muscles.
4. Shift the pelvis straight back as far as possible from the left knee by contracting the right-side stomach muscles and return to the starting position. Exhale forcefully.

This completes one figure-8 cycle. The normal pelvis goes through equal figure-8 cycles during walking in two complete strides. To perform all of the white tissue exercises, repeat the four stages of motions as described above with the goal of working up to 120 cycles each in twice-daily exercise sessions.

Gradually, with each exercise session, the range of motion of this exercise will increase over the first 45 to 60 days as stiff, sore and painful areas disappear.

Advanced Wobble Chair Exercises with Diaphragmatic Breathing

Advanced Wobble Chair exercises with deep diaphragmatic breathing have proven to increase cerebrospinal fluid pressure and flow. This flow is essential for brain metabolism, resulting in increased vitality and a feeling of physical and mental well-being. Advanced Wobble Chair exercises are a combination of the basic exercise with the addition of deep diaphragmatic breathing.

The advanced exercise cycles are slower, which allows more time for fluid interchange into the discs and then out through the vertebral bodies, and for oxygen/carbon dioxide exchange in the lungs. Therefore, advanced exercises require:

- Deep diaphragmatic inhalation when the pelvis is flexed and held forward both to the right and left for a slow count of one-two-three
- Slow exhalation when the pelvis is extended backward both left and right for a slow count of one-two-three

This stretching, warm-up, and exercise on the Wobble chair is performed every morning and before every mobilization. Evening workouts differ from the morning ones only in that they are followed by 20 minutes of spinal molding.

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