

## Genesis **G2** Cervical Treatment System & Software

Neck and arm pain are common symptoms affecting as much as 50% of individuals sometime during their lives. Traditionally, patients have been treated with a combination of medications and cervical traction.

Current devices apply cervical traction with a halter or harness/slide mechanism with the head and neck in some degree of flexion. The current standard protocol includes the use of tensions in the 25-50 lb range; the use of an angle of 15° to 20° of flexion for all clinical indications; treatment time of 5-10 minutes; and linear (straight-line) modes of either static or intermittent tension. We have found that none of these standard protocols are useful for treating chronic cervical pain from herniated or degenerative disc disease.

There are multiple randomized clinical trials of standard traction demonstrating that there is no significant benefit for traction over the control treatments. According to the textbook 'The Adult Spine, Principles & Practice' and 'The Quebec Task Force on Spinal Disorders', there is no scientific evidence to support the use of traction despite its widespread application in practice.

The kinematics of the cervical spine is not determined solely by the passive elements (discs, facets, ligaments and vertebrae) but is strongly influenced by the active elements (the muscles and tendons). Flexion of the head relative to the thorax (due to three dimensional movement) allows an infinite number of postures assumed by the cervical vertebrae, each produced by different amounts of contraction of the various cervical muscles.

In order to 'decompress' the discs in the cervical spine, it is critical to avoid muscle guarding (and spasm) that will not only resist the pull but will apply a 'counter' force to the tension and will actually increase the disc pressure. The incorrect angle of pull can actually 'trigger' muscle guarding.

***The revolutionary Genesis G2 technology combines applying tension in a logarithmic time/force curve, and establishing an optimal 'arc' or 'curve' of the tension source (either in flexion or extension).***

Patients are now able to really relax the head and neck muscles during treatment, while the tension reduces the load on the spine. Most patients may now be treated within a range of 10-22 lbs of tension, each with their own specific programmed **dynamic arc**. Patients treated for cervical decompressions are placed on the table in the supine (face-up) position, with their head at the tensioning end of the table.

### **G2** Cervical: A System Like No Other

The G2 Cervical system uses VAX-D's cervical protocols, which include proprietary hardware, software and treatment methods developed exclusively by VAX-D.

Patients receiving VAX-D cervical treatment are treated wearing a harness with a supportive cervical/neck collar. The collar is a critical part of the harness that is designed to allow some mobility of the patient's head and neck during distraction, while providing the total support of a circumferential lifting system.

Studies\* have shown that the polyethylene collars we use will reduce motion in the cervical spine (C3-C4 to C6-C7) to approximately two thirds of normal, as opposed to other collars that reduce motion by only one third (\*Fisher, Bowar, Awad, Gullickson; *Cervical Orthoses Effect on Cervical Spine Motion: Arch Phys Med Rehab*).



The collar provides the necessary immobilization and protection for patients in the post treatment period when the muscle guarding reflexes have been reduced. **Without the protection of the collar, head and neck movements will trigger muscle spasm, increased disc pressure and neck pain.** Traction equipment that 'fixes' the patient's head on a linear slide, only moves in a straight line, and does not provide the mobility of our dynamic system.

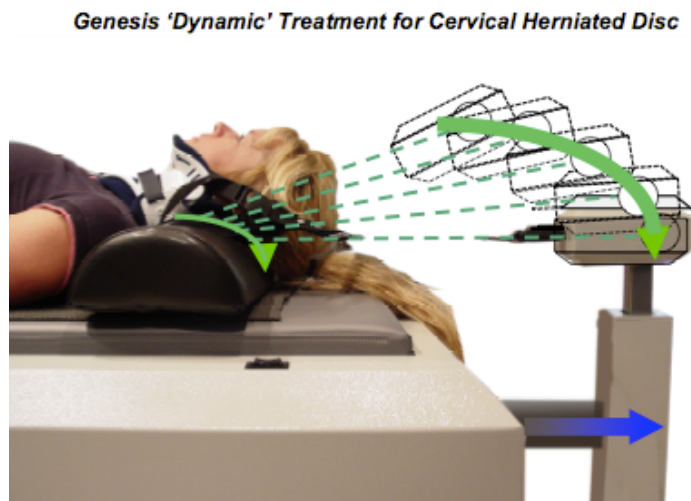
Each patient may have their own collar for the duration of the treatment. The patient can retain their collar and wear it during the treatment, and for a short period after. This provides stability, while the muscles accommodate to the movements of the head and neck. **The cervical collar protocol is more than just a novel idea, it is one of the absolute keys to success.**

## The **G2** Advantage • Dynamic Mode for Cervical Decompression

Some patients feel more comfortable with the head and neck in 'flexion' (tilted forward) while others need to be in 'extension' in order to apply tensile forces comfortably. It therefore requires some skill and experience in determining this 'optimum' curve of the pull for each patient. The operator cannot use standard formulas (or angles) that will apply to all patients. They must establish a dialogue with each patient during the set-up phase of treatment. The patient will need to experience the process in order to provide feedback on determining the best head/neck vectors for tension.

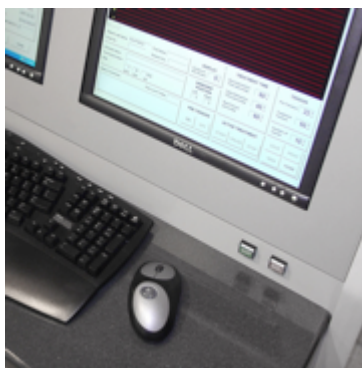
The Genesis **Dynamic Mode** allows the operator to program the tensionometer to move synchronously in the horizontal and vertical plane in order to apply tension in a curvature that is comfortable for the spine.

The tensionometer head will move in an 'arc' from the starting point to the end point. It can be programmed to move in an upward (flexion) or downward (extension) arc. Communication with the patient will determine the most comfortable settings.



Neck treatments last about 35-45 minutes and are administered each day for 15-20 days.

The G2 software provides precise programmable motion control and absolutely accurate force sensing and positioning through **Biofeedback**. The tension is sensed by an electronic force gauge, and the information is transmitted hundreds of times each second to the operating system computer. The computer analyzes the data and makes the appropriate changes to the motion control elements. Any of the treatment parameters can be changed instantly during the treatment.



### Monitoring Patients For Success

The optimum patient parameters should be established in the first few treatments. Often, adjustments have to be made to the set-up and treatment parameters after the patient has had a chance to experience a couple of treatment sessions

Patients should feel very comfortable with their collar/harness, the tensions applied and the vertical height parameters. Our goal is to make the patient 'pain-free' during the treatment session itself. With the optimum set-up, patients will become so relaxed and comfortable during treatment, that they almost fall asleep. Some practitioners describe this as the patient being '**in the zone**'. This indicates that neck muscles are relaxed and the patient is comfortable. This is a good prognostic indicator of success.

