

*Mechanically
Assisted
Manual
Techniques:
Distraction
Procedures*

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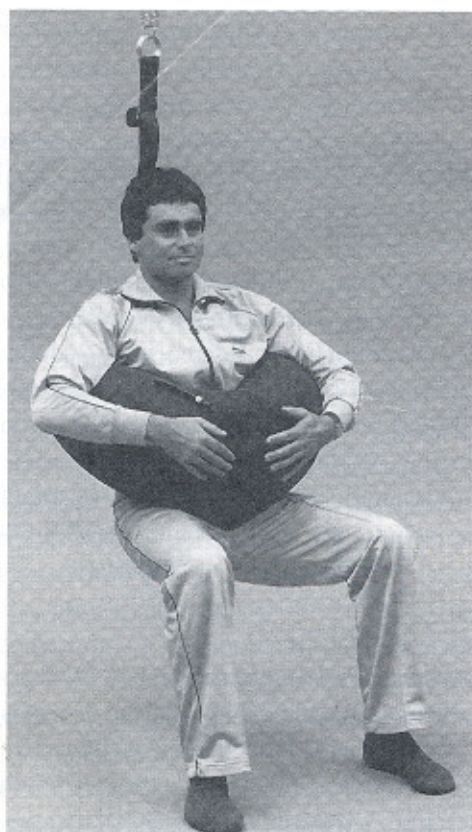


Fig. 7-5 The Back Bubble.

- Patient secures the device around the waist and under the arms.
- Patient assumes a seated posture while suspended in the device.
- Patient maintains seated posture and maintains the position of knees flexed, with feet flat on the floor, creating traction on the lower back. (Courtesy Back Bubble, Inc., Solana Beach, Calif.)

portable gravity-dependent, self-operated traction device for use in either a clinical or home setting. The unit consists of two upright members, adjustable for height and width. The upper section of the unit contains a sling seat, with arm rests further toward the top of the unit. These arm rests include a padded structure that, when fully engaged, rests against the lower rib cage. This support is important because it provides support for the body as it sits suspended, with the pelvis creating the weight for tractioning the lower back. (Figs. 7-6 through 7-12.)

The initial purpose for the unit was to create traction for the lower back. The LTX 3000 has evolved, however, and is now used extensively in the rehabilitation process, with exercises and stretching positions developed for use with the unit. A recent study by the University of Minnesota tested the capability of the device to produce spinal unloading. Fourteen subjects used the device for a series of sessions lasting 4 weeks.

Radiographic images taken at various times during the unloading process show a considerable increase in intervertebral spaces. The results of the study led researchers to determine that 10 minutes of this traction appears to be the optimum time for maximal lumbar lengthening. The study also reports that nearly all subjects demonstrated a dramatic reduction in lumbar curvature.⁹

The results expected from use of the LTX 3000 include increasing the intradiscal area by providing traction on the lumbar spine and unloading the spine, thereby reducing low back pain. Sitting in the position required by the LTX 3000 allows the patient to perform certain rehabilitation exercises to stretch and strengthen the low back. This device also allows the clinician to perform mobilizing manipulation.

THE GRAVITY LUMBAR TRACTION FRAME

The Gravity Lumbar Traction Frame was used prominently and written about by Charles Burton, M.D. This device was used frequently at the Sister Kenny Institute in Minneapolis, Minnesota, since the mid 1970s, when the program of low back treatment known as the Gravity Lumbar Reduction Therapy Program (GLRTP) was introduced. As noted by Burton,¹⁰ the protocol for use of the device was to gradually load the lower body in traction by increasing the tilt of the frame over several days. This allowed the patient to acclimate to the traction and allowed the force to be applied gradually. (Fig. 7-13.)

This device is used on both chronic and acute patients with low back pain and is coupled with a course of exercises and toughening, or hardening, activities. This treatment has become generally an outpatient activity, and the Low Back Club was formed for ambulatory patients at the Sister Kenny Institute. The objective is to return the injured worker to work as soon as possible, before compensation issues arise.

INVERSION: THE BACK-A-TRACTION AND GRAVITY GUIDING SYSTEM

The Back-A-Traction is a Swedish-designed form of inversion therapy performed on a table. Most inversion devices are related to the early gravity boots or Gravity Guiding System that were used in the past but have since fallen from favor because they allow little control by the patient. The Gravity Guiding System required the use of special foot and ankle supports that snapped into place. Each support had a hook on the front that allowed a temporary connection to an overhead bar, which had to be installed by the patient. The inverted mounting of the bar by the patient proved difficult or impossible for most patients. (Fig. 7-14)



Fig. 7-6 Patient entering LTX 3000 lumbar traction device.

- The LTX 3000 is adjusted for patient height and size, ensuring that the device is correctly adjusted for patient comfort and safety.
- To enter, the patient grasps the lock releases with the fingers of each hand while assuming a sitting position on the sling located under the buttocks.
- The full weight is not borne by the sling but is partially supported by the patient's hands. With release of the locks, the torso pads move toward the body to support the torso and allow traction to the lower spine.
- Note that the knees are flexed and help support the weight of the patient as seating is completed. The torso is to maintain a near vertical position as the device is adjusted.
- Note the white rectangular sheet to the left of the device; this is the instruction sheet for the operator and the patient. (Courtesy Spinal Designs, Minneapolis, Minn.)



Fig. 7-7 Patient assuming a seated position in LTX 3000 traction device.

- Patient is fully seated, and the feet are relocated, with a right angle bend of the knees. The full weight is borne by the seat, and the torso pads press against the body.
- After a few seconds in this position, the torso pads are released to create an improved position against the body and the seat sling is released about 1 inch, increasing the traction on the lower spine.
- This process of increased release of the sling coupled with adjustment of the torso pads can be repeated 2 or 3 times, until the appropriate traction in the lower spine is achieved.
- All the adjustments should initially be performed by the operator.
- With supervision, the patient can become proficient in making most of the adjustments. (Courtesy Spinal Designs, Minneapolis, Minn.)

The Back-A-Traction inversion device incorporates high quality and heavy-duty construction. The patient is fastened into the foot clamps, which then allow control of the inversion process through stages. When the table tilts backward and the patient is positioned, the first stop is at full parallel to the ground. A release of this position

must be initiated by the patient, and the second and third positions are accessed. The greatest inversion of this device is approximately 15 degrees below horizontal, and stops are automatic at each subsequent position toward the maximum inversion. Release from the position is initiated with the handle that is held constantly by the patient. (Fig. 7-15.)

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Fig. 7-8 Patient repositioning feet for exercise in LTX 3000 traction device.

- Patient is seated comfortably and correctly in the LTX 3000, with the sling tension partially released, so that more of the body weight is borne by the torso pads and the lower back is in traction.
- Exercises can be performed while the patient is in the traction position; proper positioning of the feet can facilitate the exercise process.
- This illustration demonstrates the way in which the pelvis can be rocked forward and backward (extension-flexion).
- The patient's arms can rest on the padded rests adjacent to the torso. (Courtesy Spinal Designs, Minneapolis, Minn.)



Fig. 7-9 Patient repositioning feet in full knee flexion under LTX 3000.

- Patient is seated correctly in the LTX 3000, with the knees in full flexion under the device, in preparation for pelvic tilting and rotation of the pelvis right and left. (Courtesy Spinal Designs, Minneapolis, Minn.)

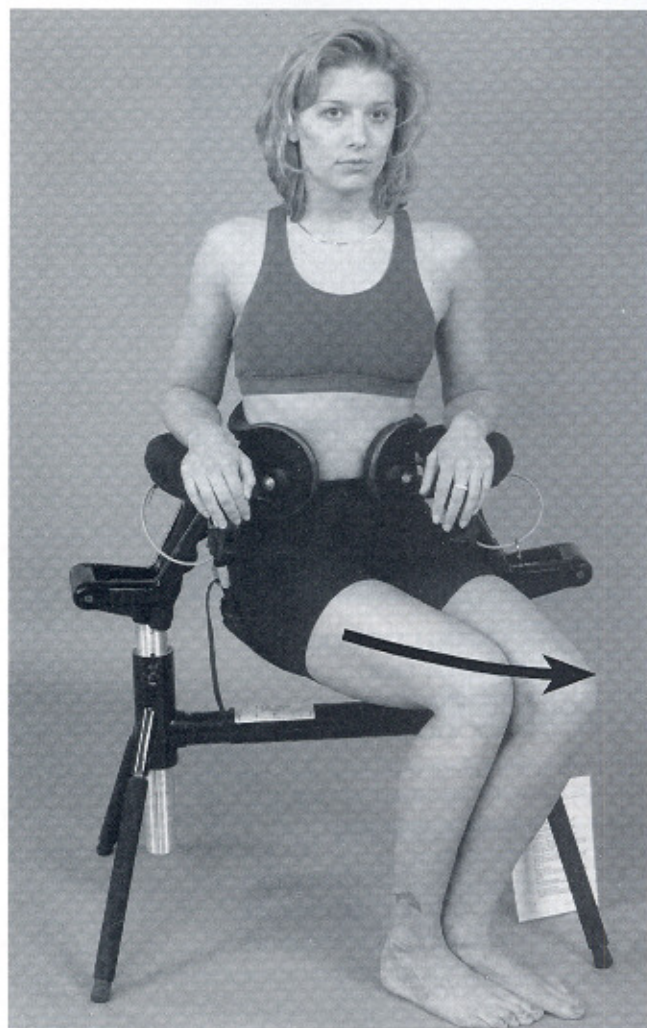


Fig. 7-10 Patient rotating pelvis in LTX 3000.

- Patient with feet positioned so that knees are near right angles and rotated to the left.
- This is another exercise position for the device. Other exercises can be performed on the LTX 3000 by acute, chronic, or rehabilitating patients. (Courtesy Spinal Designs, Minneapolis, Minn.)



Fig. 7-11 Clinician positioned for posterior adjustment of patient on LTX 3000.

- Patient is positioned on the LTX 3000, with the arms at rest and traction on the lower back resulting from the seated position.
- One leg is fully extended; the other leg is flexed, with the knee less than 90 degrees; and the lower back relaxed.
- Clinician is positioned behind the patient, kneeling with a stable squatting stance to create sufficient leverage on the patient.
- With this position, the right ilium is flexed slightly. This facilitates the clinician performing a mobilizing repeated thrust into the right ilium, creating movement in the right sacroiliac joint. (Courtesy Spinal Designs, Minneapolis, Minn.)



Fig. 7-12 Close-up of clinician performing posterior adjustment on LTX 3000.

- Patient is positioned on the LTX 3000, with traction on the lower back.
 - Clinician is positioned kneeling behind the patient, mobilizing the ilium.
 - This is being performed while the patient is in seated traction, with the spine unloaded.
- (Courtesy Spinal Designs, Minneapolis, Minn.)

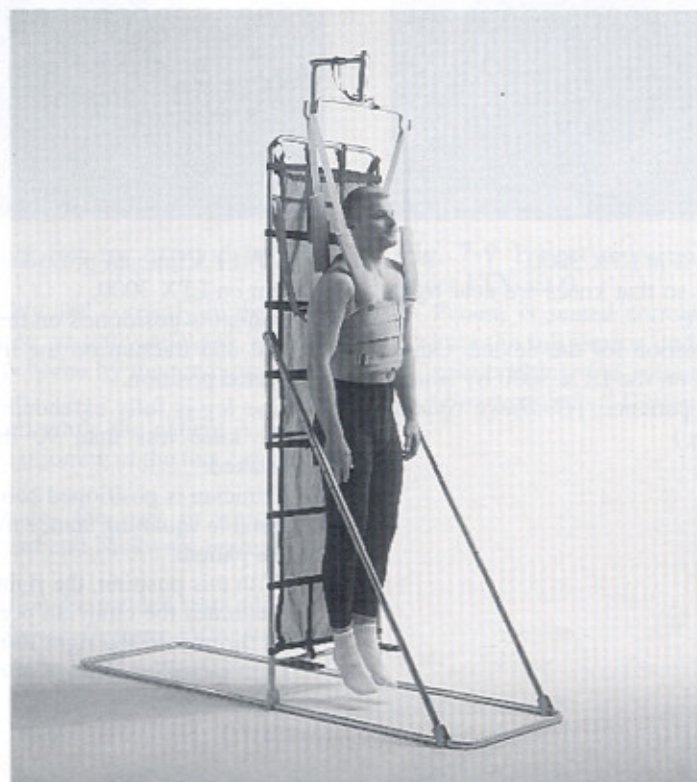


Fig. 7-13 See legend opposite page.

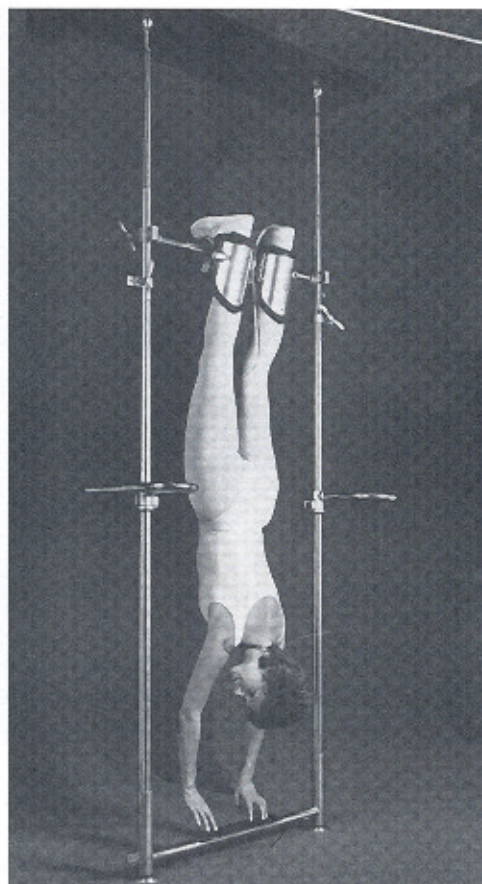


Fig. 7-14 The Gravity Guiding System

- The gravity boots are fitted to the patient's ankles and strapped on.
- Patient is assisted or climbs into an inverted position, clipping the boots onto the hanging rod.
- Patient then hangs suspended for a period ranging from 2 minutes to 30 minutes. (From Martin RM. *The Gravity Guiding System: Turning the Aging Process Upside Down*. Pasadena, Calif: Gravity Guidance, Inc; 1975.)

Fig. 7-13 The Gravity Lumbar Traction Frame.

- Patient ready to receive traction in a near-upright position.
- Patient is harnessed into the frame, with the harness connected to the upper body.
- The frame is gradually positioned upright to increase the pull of gravity on the low back. (Courtesy Sammons Preston, Bolingbrook, Ill.)

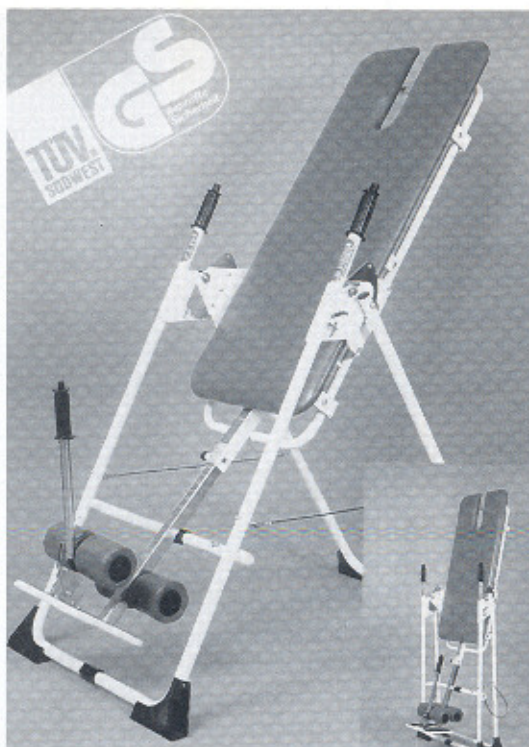


Fig. 7-15 Advertisement for the Swedish Back-A-Traction.

- Patient is fastened into the device at the ankles.
- The bed is adjusted for patient height.
- The release is manually controlled by the patient and can be set for a comfortable angle.
- As each level of inversion is attempted, the table (bed) stops at predetermined angles and must be released by the patient to continue the tilt toward full inversion. (Courtesy Swedish Back Care System, St. Augustine, Fla.)

Once the desired inversion is reached, the patient may initiate a mild exercise by flexing and straightening the knees, allowing the bed on which the patient is lying to slide back and forth a few inches. This process is controlled completely by the patient and can be used to enhance the condition of the back. Earlier versions of this device produced full inversion, and some patients incurred problems. In some hypertensive individuals, full inversion has the potential for increasing intraocular pressure, leading to possible damaging effects on blood vessels in the eyes.¹¹⁻¹³ The inversion produced by the modern table is much less than with earlier similar products, therefore decreasing the possibility of damaging effects.¹⁴

The concept of inversion therapy is to provide for unloading of the lower back, reducing pressure and discomfort. These devices can be used at home and are considered to be adjunctive therapy for the patient.

Certain contraindications for use of this therapy must be considered, and some precautions must be taken during the course of the therapy protocol. Patients must be selected carefully, with consideration given to the patient's cardiovascular health (possible hypertension) and the condition of the spine (osteoporosis or arthritic condition).

CERVICAL TRACTION DEVICES: THE PRONEX AND THE PNEU-TRAC

Two of the cervical traction devices available use a pneumatic traction mechanism to create the desired traction. Glacier Cross makes the Pronex, which is used with the patient in a supine position on a bed or other flat surface. The traction is provided by an expandable section over the cervical spine that is inflated by compressing a bulb similar to that on a sphygmomanometer. A headband binds the head into a contoured section designed to pre-