

## **The Use of Unweighting: Clinical Applications**

By

Dina Lund, P.T., A.T.C.,

### **The Concept of Unweighting**

"Unweighting is defined as applying vertical support to a patient in order to lessen weight bearing stress."

### **Benefits of Unweighting**

- ◆ By lessening weight bearing stress
- ◆ "... allows the rehabilitation and healing of injured tissue to begin sooner utilizing task-specific functional exercises - without the pain."

### **Gait Deviations**

- ◆ Is it a gait habit
- ◆ Soft tissue tightness
- ◆ Antalgic (painful) weight bearing
- ◆ Or are they just faking it

### **What Activities Can You Do Using Unweighting**

- ◆ Walk, jog, run
- ◆ Sidestep, crossover
- ◆ Backpedal
- ◆ Correct spinal shift
- ◆ Step up and down
- ◆ Assist standing
- ◆ Assist sit to stand
- ◆ Balance

### **Potential Diagnosis**

- ◆ ACL tear or reconstruction
- ◆ Any lower extremity strain or sprain
- ◆ Total knee or hip replacements
- ◆ Osteoarthritis, Rheumatoid arthritis
- ◆ Degenerative disc disease
- ◆ Spinal surgery
- ◆ Lower extremity or spinal fractures
- ◆ Neurological conditions that affect balance and gait
- ◆ Amputees (gait training or desensitization of residual limb)

## **Potential Factors that Influence Tolerance to Walking**

- ◆ Diabetic (insensate) foot
- ◆ Obesity
- ◆ Complex regional pain syndrome (hypersensitivity)
- ◆ Poor endurance due to metabolic disease or de-conditioning
- ◆ COPD/asthma or other chronic lung conditions

## **The Unweighting Advantage, Why Not Use The Pool**

- ◆ Cost
- ◆ Versatility
- ◆ Convenience
- ◆ Allows precise # for:
  - following orthopedic recommendations
  - documentation

## **The Unweighting Advantage: Why Not Use Spring or Weight Stack System**

- ◆ Distributes the weight evenly over range of movement
- ◆ Air is low impact

## **Contraindications For Use**

- ◆ Pregnant Women
- ◆ Nursing Mothers
- ◆ Obesity larger than vest can accommodate (54")
- ◆ Unstable fracture
- ◆ Caution with spondylolisthesis
- ◆ Compression aggravates condition
- ◆ Intolerance of vest
- ◆ Too uncomfortable to tolerate

## **What You Should Evaluate Before Using Unweighting**

- ◆ Flexibility
- ◆ Strength (MMT and endurance)
- ◆ Neurological
- ◆ Balance
- ◆ Joint instability
- ◆ Gait and use of assistive devices
- ◆ Weight bearing tolerance
- ◆ Complete medical history

## **How To Do The Harness**

- ◆ Size
- ◆ Long pants or short pants
- ◆ Avoid nylon sweat pants
- ◆ Can they stand safely to put on straps?
- ◆ Suck in air and stomach
- ◆ Tug the leg strap to tighten the opposite buttock suspension strap

## **Warm Up Activities**

- ◆ Squat stretch
- ◆ Lateral shift corrections and extensions
- ◆ Heel cord stretch
- ◆ Hip flexor stretch

## **Sample Protocol: Antalgic Gait - Chronic**

- ◆ Unweight to comfort for antalgia correction (generally 50-60% of body weight)
- ◆ Increase speed over session(s). (Average human gait is 3.0-4.0 M/h)
- ◆ Increase duration of workout with goal of 20-45 minutes
- ◆ Once short term duration goal is met begin decreasing unweighting by 10% of Body Weight (BW) at 5 minute intervals

## **Sample Protocol: Fibular Fracture - Weight Bearing as Tolerated**

- ◆ Session 14, unweight to comfort (50-60% BW)
- ◆ Increase duration to 20 minutes continuous
- ◆ Increase speed each session (2-3.5 m/h over 2 - 4 weeks)
- ◆ Begin 5' intervals by decreasing 5- 10% of BW
- ◆ At 30+ minutes add slow speed agility drills
- ◆ Agility drills should be unweighted to 50% and on "balance" mode for safety. (sidestep, backpedal, crossover)
- ◆ Incorporate speed intervals with agility drills, taper unweight at 5 minute intervals. (Est. 6 week treatment plan 2 - 4 times per week)

## **Sample Protocol: Acute Disc Herniation**

- ◆ Unweight to comfort for first 2 weeks treatment or as needed for shift correction
- ◆ Back stretches, shift correct. May do at intervals as needed
- ◆ Increase speed each session (goal of 3-4 m/h)
- ◆ Increase duration of workout (20 - 45 minutes)
- ◆ At 2 weeks begin to decrease unweighting by 5-10% BW at 5' intervals
- ◆ Wean off system between 2-4 weeks as they maintain neutral spine during gait

## **Sample Protocol: Hemiplegia due to Cerebral Vascular Accident or Head Trauma**

- ◆ Manual and thermal techniques (decrease excessive tone) prior to gait training
- ◆ Unweight % of BW to allow patient to stand with minimal assistance. "Balance" mode on unweighting system.
- ◆ Treadmill should allow as low as 5 m/h and patient must be at this pace during gait with assistive devices.
- ◆ Practice stance, weight shifts, and progress to step overs.
- ◆ Control genu recurvatum: theraband behind knee, or swiss knee cage.
- ◆ Assist dorsiflexion and hip flexion with theraband from forefoot to gait belt.
- ◆ Establish control of trunk lean and Trendelenburg gait prior to increasing speed and duration on treadmill.