The Use of Unweighting: Clinical Applications
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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 antaigia 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 IO% 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.