Traction

- Process of drawing or pulling apart...
- May involve distraction and gliding
- Pulling 2 articulating surfaces away from each other

Types of Traction

- **Axis**
  - Traction in line with the long axis of a part
• Head traction
  ◦ Traction applied to the head for injuries to the cervical vertebrae, intervertebral discs, nerves or muscles

Types of Traction

• Weight
  ◦ Traction application through the use of:
    • Weights
    • Pulleys
    • Ropes
Immobilization

- Fractures that cannot be immobilized in a cast utilize traction for immobilization

Immobilization

- The muscles of the limb act as an internal splint to protect the fracture
  - And provide mechano-receptive input for pain relief
• **Skin traction**
  ◦ Applied with something that encircles the extremity
    • Used when not more than 5-6 pounds of pull is required
    • Used for longitudinal pull on the LE
    • Used for femoral shaft fractures in pediatrics

• **Skeletal traction**
  ◦ Drilling a small hole transversely into the bone and inserting a small diameter wire (1/8 inch) through the bone
    • Makes it possible for increased tolerances of weight for traction
    • Femoral shaft on an adult would require 20-30# of pull
**Immobilization**

- **Skeletal Traction**
  - Can be applied to distal areas
  - Comfortable for patients

For femoral fractures it is most commonly applied through the proximal tibia just distal to the tibial tubercle.

Procedure increases the possibility for infection.
  - Aseptic techniques are important
**Crutchfield Tongs**

- Skeletal Traction for fractures of dislocations of the cervical spine
  - Applied through the outer layer of the skull
  - Allows for 30-40# in against gravity position
  - (with a halo attachment)

**Spinal Traction**

- Effects
  - Separation of vertebral bodies
  - Distraction/gliding of facet joints
  - Increased tension of spinal ligamentous structures
Spinal Traction

• Effects
  ◦ Increasing the intervertebral foraminal spacing
  ◦ Straightening out the spinal curves
  ◦ Stretching of the spinal musculature

Types of Spinal Traction

• Continuous
  ◦ Applied for up to several hours at a time
  ◦ Long duration requires that only small amounts of weight be used

Traction & LBP
Types of Spinal Traction

- Continuous
  - Believed ineffective in actually separating the spinal structures since the patient is not receiving pull sufficient to separate vertebrae

- Sustained or Static
  - Steady amounts of traction applied for 5-30 minutes
  - Heavy poundage (shorter duration)
  - Most effective with a split table (friction)
  - Traction tables, mechanical devices
• Intermittent Traction
  ◦ Traction force alternately applied and withdrawn every few seconds
  ◦ Pull time is at least 7 seconds, rest ½ the pull time
    • Stretching only occurs after 7-30 seconds of pull

• Manual Traction
  ◦ Applied through the hands of the clinician
  ◦ May be more difficult for the patient to relax
  ◦ Difficult to reproduce the force with precision
  ◦ Difficult to maintain the necessary force to produce a separation
Types of Spinal Traction

- Positional Traction
  - Placing the patient in various positions using
    - pillows, blocks or sandbags
  - to effect the longitudinal pull on the spinal structures

- Positional Traction
  - Usually applied in side lying/lateral bending
    - To affect structures on one side
Types of Spinal Traction

- Auto Traction
  - Performed with a specific piece of equipment
    - A traction table in 2 segments that
      - Can be individually angled and rotated
      - The patient’s body weight and gravity make up the traction force when the patient is suspended from the trunk in a vertical position.

- Gravity Lumbar Traction
  - Boots are applied to the ankles,
  - The patient is literally inverted on a table or bar
  - The patient’s body weight acts as traction
    - Adding weights to the patients hands increases the traction force
      - Upper body, arms & Head = 50% of body weight
Indications for Spinal Traction

- Disc herniation with protrusion
  - Disc protrusion can be reduced
  - Spinal nerve root compression can be reduced
  - Flattening of the protrusion
  - Material drained from the epidural space into the disc space via a suction force

Indications for Spinal Traction

- Joint dysfunction
  - Traction applied to a series of spinal segments
    - Each segment in the series receives an equal amount of traction
    - Passive motion for the joints
Indications for Spinal Traction

- Degenerative Disc Disease
  - Temporary separation of vertebrae
    - If there is a sudden onset of pain, Traction will provide relief of symptoms

Contraindications for Traction

- Structural disease secondary to tumor or infection
- Patients with vascular compromise
- Conditions where joint movement is contraindicated
Contraindications for Traction

- Acute sprains, strains and inflammation
- Spinal instability
- Pregnancy
- Osteoporosis
- Hiatal hernia
- Claustrophobia

Techniques for Lumbar Traction

- Patients MUST be able to relax!
- Split tables virtually eliminate friction
Techniques for Lumbar Traction

- At least \( \frac{1}{4} \) to \( \frac{1}{2} \) of the patient’s body weight will be necessary to move the body horizontally

- **Poundage minimums**
  - 22-33\# for muscle relaxation
  - 66-110\# to reduce disc pressure by 25%
  - Visible separation of bodies 120\# for 15 minutes
    - Cyriax
  - Damage to vertebral structures at 400\#
    - Cadaver studies
• Friction
  ◦ The resistance to movement
  ◦ Attractive force between and object and the surface that it is resting upon

Techniques for Lumbar Traction

• Coefficient of Friction
  ◦ Human body on a mattress
    • = 0.5
  ◦ A force of ½ of the patient’s body weight will be necessary to move the patient’s body horizontally

Hmmm...does this look like it would be ½ of her body weight?
Techniques for Lumbar Traction

- Disc Herniation with protrusion
  - Sustained traction
    - Longer hold times
      - 60 seconds hold, 20 seconds rest

Techniques for Lumbar Traction

- Treatment times
  - 10 minutes intermittent
  - 8 minutes sustained
    - To maintain the effect of suction on the disc pressure
Postural Traction

• Most often for unilateral separation
  ◦ Pt. is sidelying over a rolled pillow or a blanket that is 6-8 inches in diameter placed at the level where the separation is to occur

Learn more about traction and alternative treatment techniques.

Cervical Traction Techniques

• Positioning
  ◦ Sitting versus supine
Cervical Traction Techniques

- Head Halters
  - Pull needs to be more from the occiput than the mandible
  - Potential problems for patients diagnosed with TMJ disorders

- 9-10# for simple relaxation of cervical musculature
- 25-40# stepped progression necessary to produce measurable changes in the posterior CS
Cervical Traction Techniques

- Pull time = **twice** the relax time
- 7-30 seconds pull time
- 120# will **RUPTURE** a disc

Cervical Traction Techniques

- Relaxation decreases muscle guarding
- Shorter treatment times are “tolerated better” than longer treatment times
Manual Cervical Traction

- Applied through the hands of an experienced clinician
- Difficult to reproduce the force
- Difficult for the patient to relax

Spinal Traction

- Indications
  - Disc herniation with protrusion
  - Nerve root compression
• **Contraindications**
  ◦ Structural disease
  ◦ Vascular compromise
  ◦ When movement is contraindicated
  ◦ Acute sprains & strains
  ◦ Inflammation
  ◦ Pregnancy
  ◦ Claustrophobia

**Spinal Traction**

**Halo Traction for Cervical Fracture Stabilization**
Cervical Traction for Fracture Stabilization without the Halo attachment

Stabilization through external support
Stabilization through External Support

Traction & Distraction/Glide