Therapeutic Modalities

What are they?
- Therapeutic = something that promotes healing and injury repair
- Modality = the method of application of any therapeutic agent

Many different modalities to choose from

Selection is dependant on:
- Prescription
- Indications and Contraindications
- Injury site, type and severity
- Athletes willingness to accept treatment
LEGAL CONCERNS

- Must be administered in accordance with local regulations
- Documentations of all treatments
- Misuse or overuse of a modality can:
  - Aggravate the condition
  - Delay the athlete’s return to play
A principle of pain control

- There is a “gate” within the spinal cord that organizes and interpret sensations
- Larger fast nerve fibers carry sensations such as temperature and pressure
- Smaller, slower nerve fibers carry the pain sensation
- Stimulating the larger, faster nerves can “close the gate” on the smaller slow pain nerves
- Translation: Cold, heat, acupuncture, rubbing an injury and chemical irritants can provide relief against pain
TYPES OF MODALITIES

- Cryotherapy
- Thermotherapy
- Contrast Bath
- Electrotheraphy
- Massage
CRYOTHERAPY

- PHYSIOLOGICAL Effects
  - Decrease in blood flow
    - Vasoconstriction
  - Decrease in muscle spasms
  - Decrease swelling
  - Decrease in pain perception
- To maximize effects should be used with RICE
R.I.C.E

- Rest
  - Immobilization
  - Crutches
- Ice
  - Apply appropriate cryotherapy modality
- Compress
  - Compression wrap or sleeve, ace bandage
- Elevate
  - Injured body part above heart
  - May be best method for reducing swelling

- RICE method should be used first 2-3 days of injury
- Ice for 20-30 minutes
- Reapply every 1-2 waking hours
- Keep compression on and elevate when possible
CRYOTHERAPY

- Indications
  - Swelling and inflammation present
  - Acute soft tissue injuries
    - Sprains
    - Strains
    - Contusions
    - Spasms
    - Tendonitis

- Contraindications
  - Allergic
  - Circulatory disturbances
  - Raynaud’s phenomenon
  - Prolonged application
    - Over superficial nerves
    - Longer than 30 minutes = adverse effects
      - Hunting Response
STAGES OF CRYOTHERAPY

- 0-3 minutes after initiation feel cold sensation
- 2-7 minutes after initiation feel mild burning, aching
- 5-12 minutes after initiation feel numbness, anesthesia
METHODS OF APPLICATION

- Ice bag
- Ice massage
- Ice immersion
- Chemical coolant
CRYOTHERAPEUTIC METHODS

Ice Packs
- Flaked or crushed ice in a towel or plastic bag
- Apply for 15-20 minutes combined with RICE
- Can be used on any area of body - easiest and simplest.

Ice Massage
- Paper cup filled with frozen water to from an ice cylinder
- Rub or massage directly over area until skin becomes bright pink - usually for 7-10 min
- Tendonitis, muscle spasms, neck strains, bursitis
Cold Water Immersion
- Whirlpool, bucket or container filled with mixture of water and ice- temp- 55-65 degrees F
- Immerse for 10-20 minutes
- Great for hands, feet, ankles or knees
- Can be combined with stretching or exercises

Chemical coolant
- Vapocoolant Cold spray
- Sprayed on surface of skin
- Used for myofascial pain and trigger points
- Effects are temporary and superficial
Physiological Effects
- Decrease muscle spasm
- Decrease pain perception
- Increased blood flow-vasodialation
- Increase metabolic rate
- Decreased joint stiffness
- Increase range of motion
- Increased general relaxation
Thermotherapy

- **Indications**
  - Sub-acute injury
  - No signs of inflammation
  - Best done before therapy/ exercise
  - Tendinitis
  - Strains
  - Spasms

- **Contraindications**
  - Acute injury
  - Loss of sensation
  - Eyes
  - Genitals
  - Pregnant abdomen
  - Malignancy
  - Monitor often, especially elderly and infants
THERMOTHERAPY METHODS

- Moist Heat Packs
- Whirlpool Bath
- Ultrasound Therapy
MOIST HEAT PACKS

- Hydrocollator Packs
  - Silicate gel in a cotton pad immersed in 170 degrees of hot water
- Apply 15-20 minutes
- Layers of towels are placed between skin and pack
- Superficial heat
WHIRLPOOL BATH

- Tank with a turbine motor which regulates the movement of water and air
  - Creating a hydromassage

- Reduces swelling, muscle spasm and pain and active movement is also assisted

- Treatment time is dependant upon area
  - 10-30 minutes

- Tank must be drained and cleaned daily to prevent disease transmission
Ultrasound Therapy

- Ultrasound uses high frequency sound waves
- Sound energy causes molecules in the tissues to vibrate, thus producing heat and micro massage of the tissues
ULTRASOUND

Indications
- Post acute soft tissue trauma
- Bursitis
- Tendonitis
- Fascitis

Contraindications
- Acute injury
- Inflammation
- Over areas with limited vascularity or sensation
- Over
  - Ears
  - Eyes
  - Heart
  - Reproductive organs
  - Endocrine glands
  - CNS
  - Open growth plates
APPLICATION OF ULTRASOUND

- There must be a coupling medium
  - Lotion, gel, water applied to the skin
- Transducer (sound head) should be kept moving at all times

- Treatment time and intensity the stage of injury and depth of target tissue
- Best results occur is stretching is performed immediately after
ELECTROTHERAPY

- Physiological Effects
  - Decrease pain
  - Increase blood flow
  - Increase Range of Motion
  - Exercise muscle tissue to decrease atrophy
  - Re-educate muscles
Contrast Baths

- Alternating thermotherapy and cryotherapy

- Whirlpools, buckets, hot packs and ice bags can be used

- Alternating hot and cold increases local circulation to the treated limb
  - Vasodilatation-Vasoconstriction

Application

- 4:1 or 3:1 ratio
- Hot: Cold
- Begin with thermotherapy modality
- End with cryotherapy modality
- Alternate for 20-30 minutes
**ELECTROTHERAPY**

- **Indications**
  - Acute injuries
  - Sub-acute injuries
  - Chronic injuries
  - Swelling
  - Strains
  - Spasms
  - Pain

- **Contraindications**
  - Pacemakers
  - Pregnancy
  - When muscle contractions are not wanted
  - Metal implants
  - Areas of active bleeding
  - Near malignancies
Moist electrode pads are placed on the skin.
Closer the pads are the shallower and more isolated the muscle contraction.
The farther apart the pads are, the deeper and more generalized the contraction.
Active exercise can be used at same time.
Ice packs, cold water immersion and ultrasound can all be combined with electrotherapy.
MASSAGE

- **Therapeutic and Physiological Effects**
  - Stimulating Cell metabolism
  - Increasing venous flow and lymphatic drainage
  - Increase circulation and nutrition
  - Stretches superficial scar tissue
  - Relaxes muscle tissue

- **Contraindications**
  - Acute injuries
  - Hemorrhaging
  - Infection
  - Thromboses
  - Nerve damage
  - Skin Disease
  - Possibility of Calcification
MASSAGE

- Use lubricants
  - Oil, lanolin, lotion, powder
- Stroke toward the heart
  - Increases venous return to reduce swelling
- Proper positioning
  - Injured part made easily accessible, comfortable and relaxed
- Be confident