Pain & Symptom Management Non-pharmacologic Treatments

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Scientific Seminar

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Disclosure

- I have no financial interest in any company or product which might be seen in this lecture.

- All slides are either made by this lecturer or from public domain.

Approach of the Lecture

- Due to the structure of the MOA conference, this lecture is designed for a broad array of physicians, including those who generally do not treat neuro-musculoskeletal problems.

Introduction

- The most common approach to treating pain symptoms regardless of underlying diagnoses is with medications.
- In the acute period, correcting the underlying cause of the problem decreases and/or resolves the pain complaints.
- Acute problems which cannot be fully resolved and corrected lead to chronic problems.
- Side effects of acute and chronic problems may be more disabling than the original illness or injury due to changes in flexibility, range of motion, strength, endurance, mobility & central aspects of pain.

Symptoms and Signs

- Pain is a symptom for which we have information from the patient but no good algometer.
- In the acute period increased temperature, erythema, swelling, muscle spasm and decreased range of motion may be consistent with acute pain. Often, we will see increased heart rate and blood pressure.
- In the chronic period usually temperature is normal, erythema and swelling are resolved, but muscle spasm and range of motion deficits can remain. Heart rate and blood pressure elevations may continue.
- Addressing these dermatologic and musculoskeletal signs can markedly improve many pain complaints.
- Using nonpharmacologic treatments may augment and/or replace pharmacologic approaches to pain.

Central Sensitization of Pain

- Also called Nociplastic pain (International Association for the Study of Pain).
- This is chronic pain that continues even in the absence of tissue damage.
- It is felt that this is a heightened response within the central nervous system to pain signals from a previous insult.
- It is out of proportion to expected levels or extent of pain complaints with respect to the original inciting problem.
- It may exist with acute pain.
- It may be over a wider region of the body than the acute injury.

Types of problems to address

- 1. Contusions
- 2. Sprains and strains, acute and chronic
- 3. Tendinitis
- 4. Capsulitis
- 5. Neuralgia
- 6. Arthritis, various types
- 7. Somatic Dysfunctions
- 8. Central Sensitization

Orthotics

- Excessive movement may aggravate myositis, tendinitis, capsulitis and pain.
- Decreased movement can decrease inflammation; but can cause muscle weakness, proprioceptive deficits, decreased synovial fluid lubrication of joints, and joint contractures all of which may be painful or aggravate pain complaints.
- There are many types of orthotics to address needs from the spine to the individual IP joints of the hands.
- Static orthotics may be used to decrease inflammation, swelling and pain complaints by immobilizing the body part.
- Abdominal binders are used to augment the abdominal muscles and decrease excessive movement in the back during heavy lifting, which may cause disc bulging and/or vertebral somatic dysfunctions.
- Dynamic orthotics are used to stretch joint capsules and muscles, and aid in improving synovial fluid in the joints and muscle weakness. Reversing these side effects generally improves pain complaints.

Prosthetics

- Amputations are painful acutely in the postoperative period. Chronically there often painful due to neuroma pain with phantom sensation.
- A well fitting prosthesis not only improves the functional use of the limb, but will give compressive force on the neuromas to decrease the phantom sensation.

Physical Medicine Modalities

- Electrical Muscle Stimulation
- Transcutaneous Electrical Nerve Stimulation (TENS)
- Ultrasound
- Diathermy

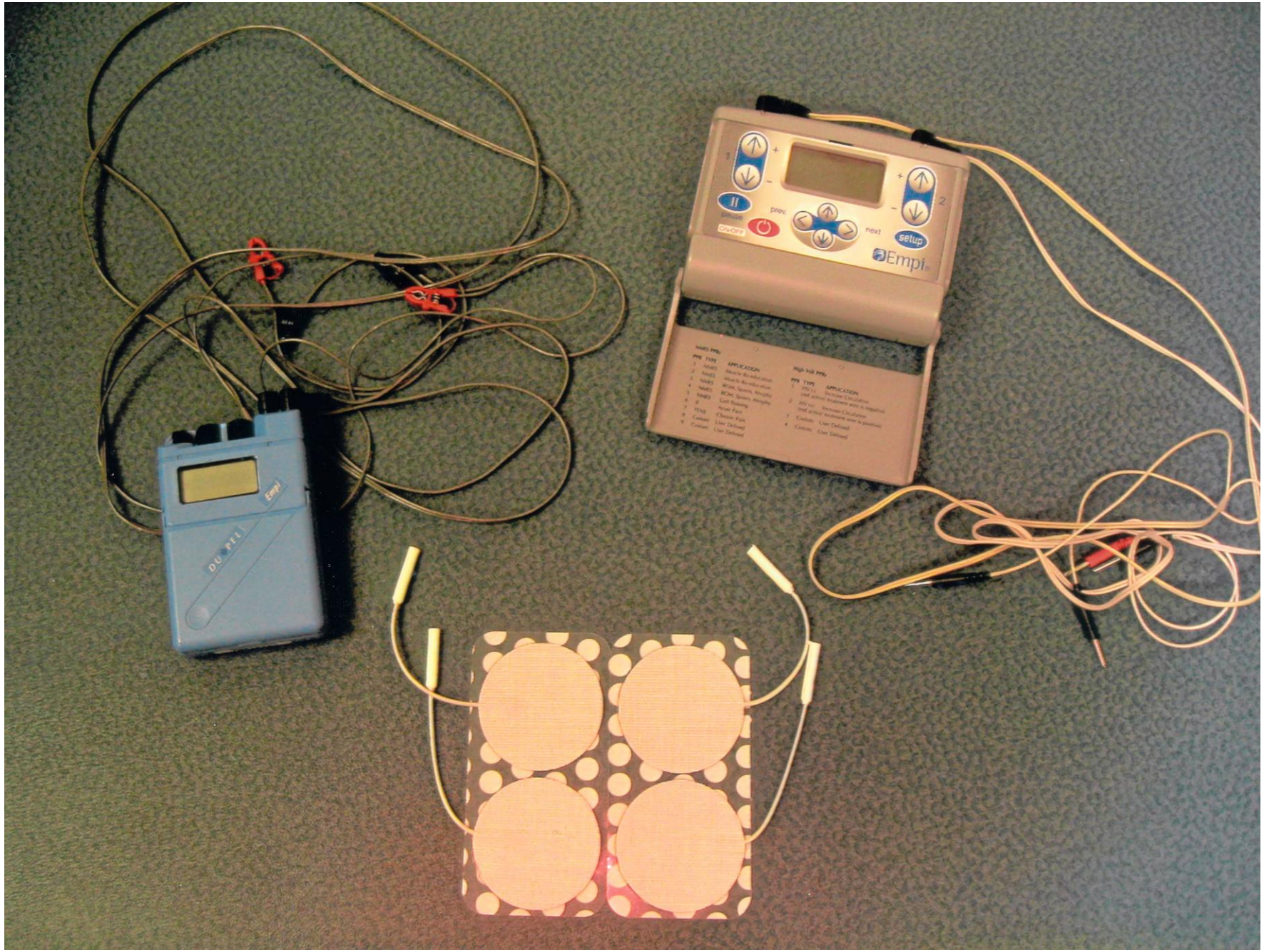
Electrical Muscle Stimulation

- The use of electrical stimulation to cause contract relax cycles in the muscles.
- Electrodes are placed on the skin over the area of muscle spasm.
- The current is adjusted to cause cyclic contraction and relaxation in the muscles.
- This can break muscle spasm, cause muscle relaxation and thereby decrease pain complaints.
- Contraindications include areas of acute or healing fractures, DVT, burns, skin lesions and in patients with implanted stimulators, pregnancy.


POWER
INTENSITY
AUTO PROCEDURE
WAIST
SHOULDER
JOINT
HAND/LEG
REPEAT
SOLE
SPEED
SPEED
MASSAGE
BEAT
KNEAD
ELECTRONIC PULSE MASSAGER

Transcutaneous electrical nerve stimulation

- Similar to EMS, theoretically this technique stimulates production of gamma-aminobutyric acid and glycine, and desensitizes dorsal horn neurons to decrease pain.
- Contraindications include pelvic area during pregnancy, over the brain or spinal cord, over eyes (potential increase in intraocular pressure), anterior neck (potential hypertension), over open wounds, across the chest (potential cardiac effects), in areas of tumors (potential stimulation of growth), and presence of implanted stimulators.


Empi
setup
Empi


PE-LD
04
Ultrasound
Output power: 2.4W
Output Intensity: 2.4W/cm²

Ultrasound

- The use of sound waves (0.7 – 3.3 MHz) to stimulate the tissues.
- Soundwave energy is absorbed by the tissues at different rates.
- The deeper the tissues the less energy delivered to them.
- Fascia, muscles, ligaments, tendons will absorb the soundwave energy with a mild increase in temperature, and blood flow is stimulated.
- Bone will reflect most of the soundwave energy reaching it causing further soundwave absorption in the soft tissues.
- This allows for greater range of motion to decrease muscle spasm, contractures and pain.
- Contraindications: fractures, skin lesions, implanted stimulators, pregnancy , tumors.


intelect 230P
INTENSITY
TREATMENT TIMER
POWER IN WATTS
INTENSITY IN W/CM²
CHATTANOOGA
ULTRASOUND ON
HEAD MAX TEMP.
DUTY CYCLE
OUTPUT
OFF
MINUTES
100%
50%
20%
AVERAGE POWER
PEAK POWER
PULSED
CHATTANOOGA CORPORATION
HYDROCOLLATOR
CHATTANOOGA CORPORATION
Sterile/Senior
Tongue Depressors


SWITCHING POWER ADAPTOR
Ultrasound
Output power: 9.6W
Output intensity: 2.4W/cm²
M/■


SWITCHING POWER ADAPTOR
IPX7
(only for ultrasonic head)
1MHz
5.0cm²
ON/OFF
DC 15V/1.2A
Output

Diathermy

- Shortwave diathermy: 1 – 100 MHz
- Microwave diathermy: 915 MHz – 2.45 GHz
- Diathermy increases blood flow and metabolism to increase the distensibility of tissues and allow for greater flexibility and range of motion.
- This then decreases muscle spasm, contractures and pain complaints.
- Hyperthermia from diathermy has been used to treat deep infections and in cancer treatment.
- Contraindications: Vascular disease, acute wounds, areas of acute inflammation, pregnancy (potential miscarriage), areas of edema and over metallic implants due to potential for burns, increased inflammation.

Complementary and Alternative Medicine (CAM)

- Osteopathic Neuromuscular Manipulative Medicine
- Medical Acupuncture
- Acupressure
- Cupping
- Gua Sha
- Trigger Point Therapy
- Neural Therapy
- Prolotherapy

Osteopathic Neuromuscular Manipulative Medicine (ONMM)

- The use of manual treatment to improve blood flow, decrease muscle spasm, increase joint range of motion, desensitized tissues, and decrease pain complaints.
- Used to correct the physical and structural causes of pain complaints and functional debility.
- Multiple techniques may be used to address the structural problems by concentrating on them with primarily soft tissue techniques or primarily bone and joint techniques.
- Uses the Barrier Concept where there is a functional barrier to normal movement.
- Direct techniques move the affected tissues to and through the barrier to correct the problem.
- Indirect techniques move the affected tissues away from the barrier to allow for relaxation and removal of the barrier.


Apply ACC Guidelines
In Your Practice
IRMC Department Of Cardiology

Medical Acupuncture

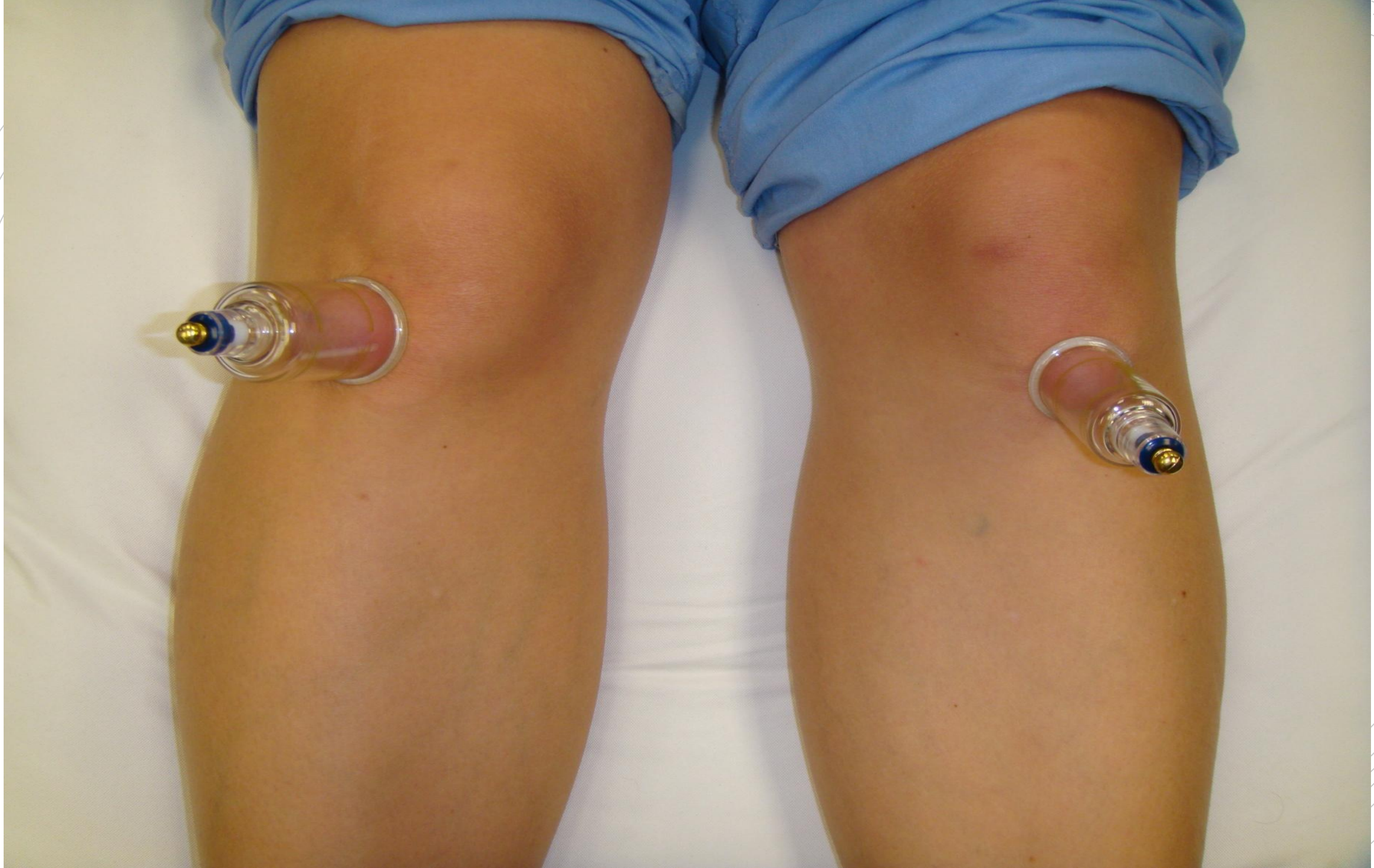
- 6,000 year old healing art which is receiving greater interest internationally for the last five decades.
- The World Health Organization has medical acupuncture approaches to treat or aid in the treatment of all diagnoses.
- Pain complaints are addressed by Neuro-anatomic Medical Acupuncture.
- Acupuncture needles are inserted at or around the area of complaint.
- Needles are stimulated manually or with low level electrical stimulation to relax muscles. (“Tonification.”)
- Needles are not stimulated and left in to decrease swelling & inflammation. (“Dispersion.”)
- Endorphins (beta-endorphin, enkephlin) are increased with low frequency (3 Hz – 50 Hz), high amplitude stimulation. This is used for acute and recurrent pain.
- Serotonin is increased with high frequency (150 Hz – 3,000 Hz) low amplitude stimulation. This is used for chronic pain and as an adjunct in chemical dependency detoxification.

Acupressure

- A variety of Medical Acupuncture.
- A blunt probe is used to compress the tissues for approximately 2 to 3 minutes.
- Theoretically this compression decreases the blood flow at the point of pressure.
- Decreased blood flow allows muscle spasm and trigger points to relax.
- Decreased muscle spasm and trigger points increases flexibility and decreases musculoskeletal pain.

Cupping

- A.K.A. Application of vaso-pneumatic device.
- A variety of medical acupuncture where suction cups are placed on areas of pain, muscle spasm.
- Suction is applied to the skin through the cups causing an irritation and improving blood flow in the area. Left in place for approximately 20 minutes.
- This allows for decreased muscle spasm, greater flexibility and decrease pain.
- Contraindications include over open wounds, fragile skin, and healing fractures.



Gua Sha

- A.K.A. "Coining," or "Skin Scraping.“
- A variety of medical acupuncture where the skin is irritated to stimulate blood flow to the area.
- This is usually done with hard plastic scrapers or smooth coins.
- This creates an inflammation drawing blood flow to the area to improve flexibility, pain complaints and possibly infections.
- A bright red to purple erythema is the desired end result of the procedure. If done to a child, a note should go with the child indicating that this was the result of a medical procedure and not abuse.
- Contraindications include over open wounds, fragile skin, and healing fractures.

Trigger Point Therapy

- A variety of manual medicine in which ischemic compression of trigger points or muscle spasm is delivered manually to decrease the blood flow in the area, allow the muscles to relax and thereby decrease the pain complaints.

Neural Therapy

- A form of treatment for pain complaints in which very small doses of anesthetic (as 0.1 mL of 1% Xylocaine) are injected into painful areas, intradermally or subcutaneously.
- Generally these are considered sub therapeutic dosing injections.
- The treatments are repeated every few days until the discomfort decreases sufficiently.
- Common areas of injection are tender points, trigger points, nerve endings, scar.
- Suggested effect: interrupting the pain pathways to break the central sensitization pain cycle.

Prolotherapy

- A mode of treatment to decrease pain complaints by injecting irritating medications (such as 17% glucose in saline or lidocaine) to augment the strength of tendon, ligament and capsular attachments.
- The prolo solution causes irritation which is followed by increased fibrotic formation which strengthens ligaments, tendons and capsular attachments to the bone.
- This decreases the excessive motion in those joints which decreases joint pain and the risk of dislocation.
- This is primarily used as a pain treatment but there is growing interest in this treatment to aid in chronic hypermobility treatment such as musculoskeletal Ehlers Danlos Syndrome.
- This is considered the first of the Regenerative therapies, as PRP & exosome gene therapy, which are gaining acceptance.

Therapeutic Exercise

- Central Sensitization of Pain
- Purpose of Therapeutic Exercise
- Physical Therapy, Occupational Therapy
- Psychology
- Coaching
- Techniques

Central Sensitization of Pain

- A difficult area due to the patient's heightened sensitivity and response to the long-term nature of the pain complaints and to nonpainful stimulation (allodynia).
- Due to patients' feelings that there is an ongoing, underlying, deteriorating problem or that any physical activity will make them worse, many of these patients develop progressive decreased mobility.
- Decreased mobility is followed by shortening and weakening of muscles, shortening of ligaments and capsular structures, decreased synovial fluid and intermittent acute pain when the patient has to perform physical activity.
- Often requires a multimodal approach to improve mobility, endorphins, relaxation and patient understanding of the problem.

Purpose of Therapeutic Exercise

- Therapeutic exercises used to reverse effects of pain stimulated mobility impairments and return the patient to normal functional mobility.
- Flexibility exercises decrease muscle spasm and regain pliability in the muscles.
- Range of motion exercises improve joint play, range of motion, and stimulate the deposition of synovial fluid within the synovial joints to decrease joint pain with movement.
- Strengthening exercises improve muscle balance and weakness from the initial injury and/or disuse wasting.
- Endurance exercises improved cardiopulmonary function and stimulate endorphin production in the brain.

Physical Therapy, Occupational Therapy

- Physical and occupational therapy can be used to train the patient in progressive improvement in the basic physical functions of flexibility, range of motion, strength and endurance.
- Progressive training can improve the tolerance for activity with less discomfort.
- Endurance building activities can stimulate endorphin production.
- The therapies are advanced to incorporate training in functional activities which the patient needs such as balance, coordination, ambulation, activities of daily living, hygiene, vocational and avocational activities.
- The patient may also be trained in energy conservation techniques. This can improve movement while minimizing strain on already stressed tissues.

Psychology

- Pain management psychologists can be utilized to identify strengths and weaknesses in the patient's emotional makeup.
- Effective counseling can train the patient in understanding when central sensitization of the pain is a symptom without a physiologic hazard to the patient.
- This can work with PT and OT to improve the patient's physical functioning and functional activity.
- Relaxation training will decrease side effects of fear of further pain such as muscle spasm and anxiety.
- Hypnosis is used for deep relaxation, attention focus, and to decrease anxiety.

Coaching

- Involvement of the patient in progressive, nontraumatic exercise programs can improve flexibility, range of motion, strength, endurance, anxiety and functional activity.
- Many patients will require assistance to get into a routine and would be aided by an appropriate coach for the activity.
- Examples are Tai Chi, Yoga and Pilates.
- Coaches, courses and training can be found in a number of ways:
- Community education programs
- Hospital programs
- Gyms
- DVD's
- On-line

Copper Fiber Clothing

- Elastic fiber clothing can give compression & decrease excessive movement which then may decrease the risk of injury during activities.
- This lecturer did not find scientific basis for copper infused clothing aiding strength and mobility.
- It is my hypothesis that copper fiber clothing may work by:
- Increasing the tensile strength of the elastic support clothing
- Aiding in the control of excessive movement which may cause injury
- Increasing the lifespan of the elastic support clothing.
- Other thoughts???
-

Nutraceuticals-1

- Ginger
- Capsaicin
- Female Ginseng
- Kava
- Peppermint
- Turmeric

Nutraceuticals - 2

- Burberry
- Frankincense oil
- Devil's Claw
- Cats Claw
- Stinging Nettle
- Feverfew

Ginger

- Zingiber officinate - A flowering plant from Southeast Asia primarily used as a food spice.
- Ginger has been shown you have analgesic effects in animal studies.
- It is thought to inhibit the release of substance P, a pain sensation neurotransmitter.
- Felt to have anti-inflammatory and anti-nausea effects.
- May help in weight loss, arthritis management, and menstrual pain.

Capsaicin

- Cayenne pepper derivative
- Stimulates and blocks small-diameter pain fibers by depleting them of the neurotransmitter substance P
- Substance P: chemomediator of pain impulses from the periphery.
- Over-the-counter topical ointment.
- Used for diabetic neuropathy, cluster headache, osteoarthritis, rheumatoid arthritis, psoriasis, postherpetic neuralgia, trigeminal neuralgia, postoperative pain.

Female Ginseng or Dong Quai

- Angelica sinensis & Angelica acutiloba – Chinese and Japanese herbs.
- Smooth muscle relaxing effects for decrease in G.I. spasms.
- Mild analgesic effect.
- Mild tranquilizing effect.
- Used for intestinal cramping, uterine cramps, trauma pain, headaches, arthritis.

Kava

- Piper mithisticum (Kava).
- A plant native to Micronesia and South Pacific islands.
- Kavalactones (kava alpha-pyrones) are concentrated in the fruit of the plant.
- These have sedative and anxiolytic effect.
- Taken as a drink made by soaking the kava root in water.
- Roots vary between 3% and 20% kavalactones.
- The wide range variable strength to the preparation.

Peppermint

- Mentha piperita - Menthol component of peppermint
- Oil used externally as a counter irritant to treat arthritis, tendinitis, and other inflammatory conditions.
- Topical treatment of the forehead and temples has been shown to decrease headaches, and to decrease temporal muscle activity on EMG.

Turmeric

- Curcuma Longa (Turmeric)
- Weak evidence of medicinal properties.
- May have mild anti-inflammatory properties.
- Mild evidence of relieving symptoms of osteoarthritis.
- Combining with Black Pepper may enhance its anti-inflammatory & analgesic effects.

Barberry

- Berberis vulgaris – From the bark, berries & roots.
- Active ingredients include isoquinoline, protoberberine alkaloids as columbamine, palmitine, berberine, & jatrorrhizine.
- Uses as an anti-inflammatory, primarily for infections.
- Used for stomach pain, diarrhea, heartburn, constipation, infections.
- Suggested is treatment for high blood pressure.

Frankincense Oil

- Hard gum like material made from the trunk of the Boswellia tree that grows in India, Africa & the Middle East.
- A.K.A. oliban oil & Boswellia.
- Administered by inhalation from steaming, topically or as an oral supplement.
- Used for arthritis symptoms, improving asthma, oral health, abdominal pain & bloating.
- Suggested to have anticancer properties.

Devil's Claw

- Harpagophytum procumbens, South African plant.
- The fruit has small projections giving it the Devil's Claw name.
- Used for low back pain complaints, arthritis, muscle aches, arthralgias, tendinitis.
- Anti-inflammatory.
- Used for fever and indigestion.
- Suggested to improve osteoporosis.
- Potential side effects include increasing heart rate & blood pressure, aggravating peptic ulcer disease, reducing sodium levels, and increasing bowel action.

Cats Claw

- Uncaria tomentosa - A tropical vine from the Amazon rain forest.
- The name comes from the hooked thorns on the vine which looks like a cat's claw.
- Taken as a liquid extract, capsule, powder or tea.
- Used to improve the immune system, and ease symptoms of osteoarthritis and rheumatoid arthritis, with some studies indicating this.
- Suggested that it may improve infections, cancer and Alzheimer's disease.

Stinging Nettle

- Urtica dioica - A plant with hair-like structures on the leaves which may cause a stinging sensation if they touch the skin.
- Consumed as a supplement, dried, freeze-dried, taken as a capsule or tea.
- Contains vitamins A, C, K and some B.
- Contains calcium, iron, magnesium, phosphorus, potassium and sodium.
- Used by ancient Egyptians to treat arthritis and lower back pain.
- Used by Roman troops as a topical rub to stay warm.
- Used to decrease inflammation and pain complaints, reduce prostate size.
- May reduce inflammation, decrease hay fever symptoms by blocking histamine receptors, decrease blood pressure, decrease blood sugar levels.

Feverfew

- Tanacetum parthenium - Plant native to Asia minor and the Balkans.
- Name comes from "Febrifugia" or "Fever Reducer." A.K.A. Medieval Aspirin.
- Consumed as a capsule of dried leaves.
- Contains the chemical Parthenolide which, via serotonin receptor inhibition, may help decrease migraine headaches pain, frequency, duration, nausea, vomiting, light sensitivity, noise sensitivity by blocking vasodilation & may stop smooth muscle spasms.
- Side effects may include G.I. distress including bloating, heartburn, constipation, diarrhea, vomiting. Chewing the fresh leaves may cause mouth sores, swelling and decreased taste.
- Suggested that it may cause uterine contractions. Therefore, it is contraindicated in pregnancy.

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