Update in Pain Management Issues for Speech and Language Pathology 2021

Lawrence L. Prokop, DO

FAOCPMR-D, FAAPMR, FAOCPMR, FAADEP

Professor

Dept of Physical Medicine & Rehabilitation

Michigan State University College of Osteopathic Medicine

Pain Complaints -

- The most common complaint seen in a doctor's office.
- Often not the primary concern if there are other medical, surgical and rehabilitation needs.
- Therapists (as SLP) may be the first clinicians to hear or see effects of the pain complaints.
- Painful conditions can be a block to progressing with rehabilitation.
  - Block the ability to move
  - Block the desire to participate

Must ID the cause of the discomfort

- Physiologic
  - Pain related to physical injury or abnormality
- Psychologic
  - Pain related to emotional stress
  - May feel like &/or coincide with physiologic pain

Physiologic Pain

- Causes may be from:
- Pre-morbid conditions
- Direct injury to tissues
- Secondary injury from scar tissue
- Compression from bracing, w/c, prosthetics
- Effects of CNS or PNS injury
- Hypersensitivity from prolonged opioid use
- Complex regional pain syndrome

Pre-morbid conditions - Examples

- Arthritis
- Short leg syndrome
- Scoliosis
- Internal medicine problems with pain complaints, as cholecystitis can cause shoulder pain, & pancreatitis can cause back pain.

Direct injury to tissue

- Tendonitis
- Neuralgia
- Capsulitis
- Arthritis
- Scar tissue

Secondary injury

A condition where effects of the injury or treatment cause new painful complaints, new injury or illness.

- Compression from P&O, DME
- Overuse from therapeutic exercise
- Sprain strain from contracted muscles and contractured joints

Effects of CNS/PNS injury

- Neuralgia
- Spasticity

Neuralgia

- Painful nerve. Pain is in the distribution of the nerve injured.
- Often has swelling in the painful area.
- May cause weakness &/or decreased reflexes in the distribution of the nerve.
- Treated with medications, nerve blocks, possible surgery.

Signs and symptoms of neuralgia

- Numbness, and tingling in distribution of a specific nerve
- Pain (sharp, burning, etc) in distribution of a specific nerve
- Pain reproduced with palpation or tapping on the nerve – for more superficial nerves (Tinel's sign)
- Weakness in distribution of a specific nerve

Spasticity

- Velocity-dependent increase in muscle tone with exaggerated MSR's from hyper excitability of the stretch reflex following UMNL.
- Treated with
  - P -> AA-> AROM
  - Oral medications
    - Diazepam
    - Baclofen
    - Tizanidine
    - Dantrolene
  - Injections
    - Chemodenervation
    - Neurolysis

Hypersensitivity from long term Opioid use

- Exogenous opioids suppress endorphins.
- Potential to permanently suppress endorphins if opioids taken for too long and at high dosage.

Complex regional pain syndrome

- CRPS/RSD/Causalgia/Shoulder-hand syndrome
- Early on trauma causes vasospasm with
- Decreased blood flow to nerves and subsequent neuralgia
- Early swelling in the area and late tissue shrinkage in the area
- Muscle spasm
- Joint contracture
- Thinning of skin
- Sever pain with movement of the limb
- Allodynia: Hypersensitivity and pain to non-painful stimuli

Psychologic

- Hesitancy of movement due to fear of causing repeat injury or trauma
- Possible flash back to cause of injury
- Fear of re-injuring previously injured &/o operated areas
- May require psychologic intervention
  - Psychologic evaluations as MMPI, Beck Depression Testing

Acute Pain

- Characteristics
  - Due to medical changes, trauma, chronic posture
  - Inflammation – Erythema (redness) of the skin, increased temperature
  - Swelling
  - Immobility ->
    - Muscle spasm ->
    - Decreased joint movement ->
    - Decreased synovial fluid production ->
    - Capsular contraction ->
    - Painful cycle repeats.

Acute Pain

- HR increases initially
- pAO2 decreases transiently
- Increase in stress hormones, as Epi & Norepi
- Usually A-delta fiber transmission

Chronic Pain

- Characteristics
  - Immobility
  - Decreased synovial fluid
  - Capsular contracture (24 – 48 hrs immobility to start)
  - No inflammation
  - Normal HR
  - Normal pAO2
  - Normal Epi & Norepi
  - Often burning, sore C-fiber type transmission

Opioid effects

- Analgesia
  - Blocks sharp A-delta fiber type pain
- Risk of Dependency to Addiction
- Acts exogenously to decrease endorphin production – blocking feedback loop
- Suggested that permanent suppression of endorphins may occur with prolonged opioid use

Endorphins

- Def: “Endogenous morphine like substances” – Endogenous opioid neuropeptides.
- Produced by CNS & pituitary gland.
- Multiple types: Alpha, Beta, Gamma, Delta, etc.
- Inhibit transmission of pain signals.
- Produce euphoria.

Endorphins

- Production blocked by opioids
- Production stimulated by
  - Endurance activities
  - Laughter
  - Medical Acupuncture – Low frequency, High amplitude stimulation
  - Sexual activity

Treatments –Primarily for Acute Pain

- Oral Medications:
- APAP - Acetaminophen
  - Analgesic
  - Not anti-inflammatory
  - Anti-pyretic
- NSAID's – Non-steroidal anti-inflammatory Drugs, as ibuprofen or naprosyn
  - Analgesic
  - Anti-inflammatory
  - Anti-pyretic
  - Anti-platelet usually
- Oral Steroids
  - Anti-inflammatory

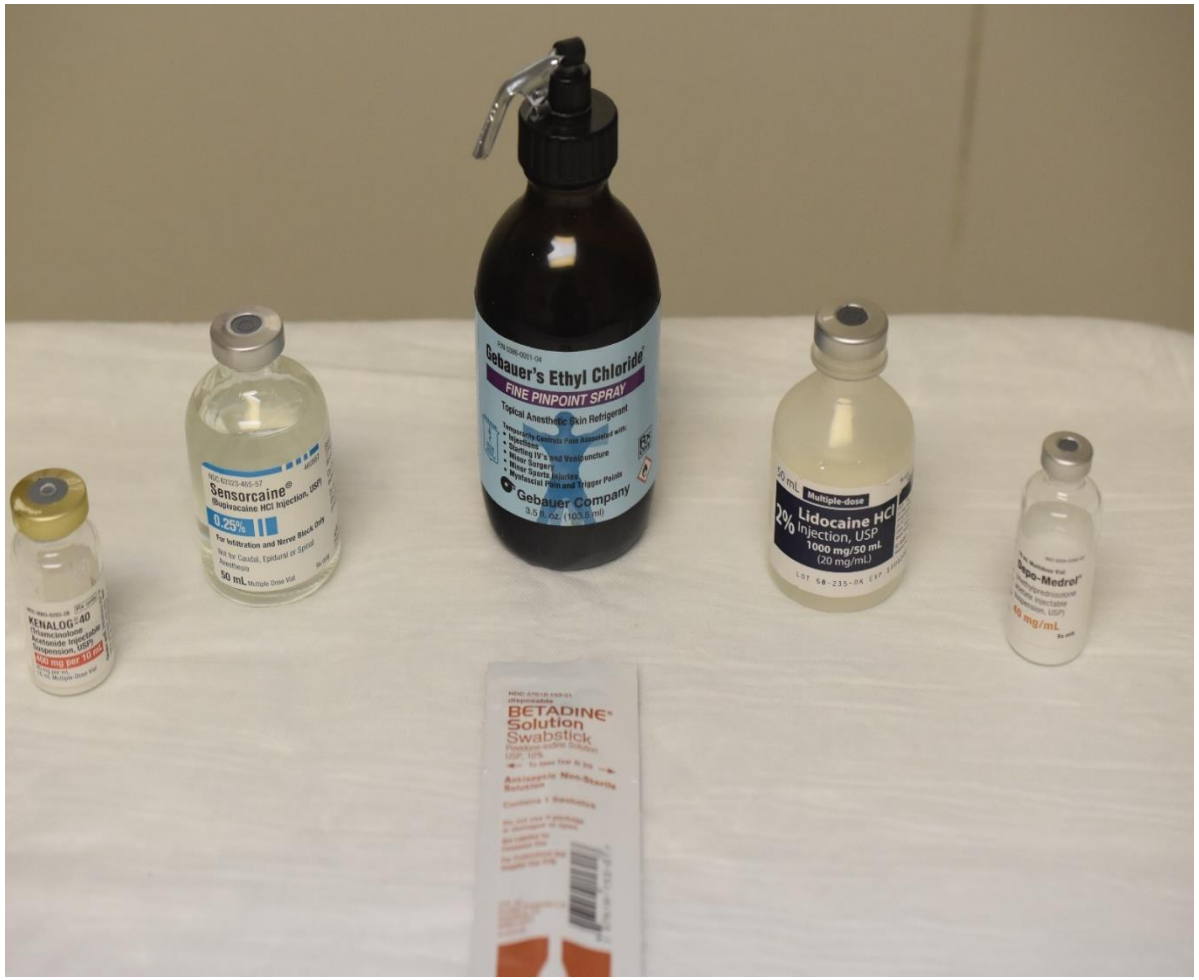
Treatments – Primarily for Chronic Pain

- Antidepressants & Anticonvulsants
  - To treat neuropathic pain – dysesthesias and allodynia, often with burning, pins & needles, and cold. Function primarily at neurotransmitters of descending inhibitory pathways from the brainstem to nociceptive pathways in the spinal cord, through dorsal horn
    - Tri-cyclics (Amitriptyline)
    - Serotonin Reuptake Inhibitors (Zoloft)
    - Gabapentin (Neurontin)
    - Pre-gabalin (Lyrica)
    - Current favorite: Duloxetine (Cymbalta) – MSK pain & anti-depressant

Treatments - Injections

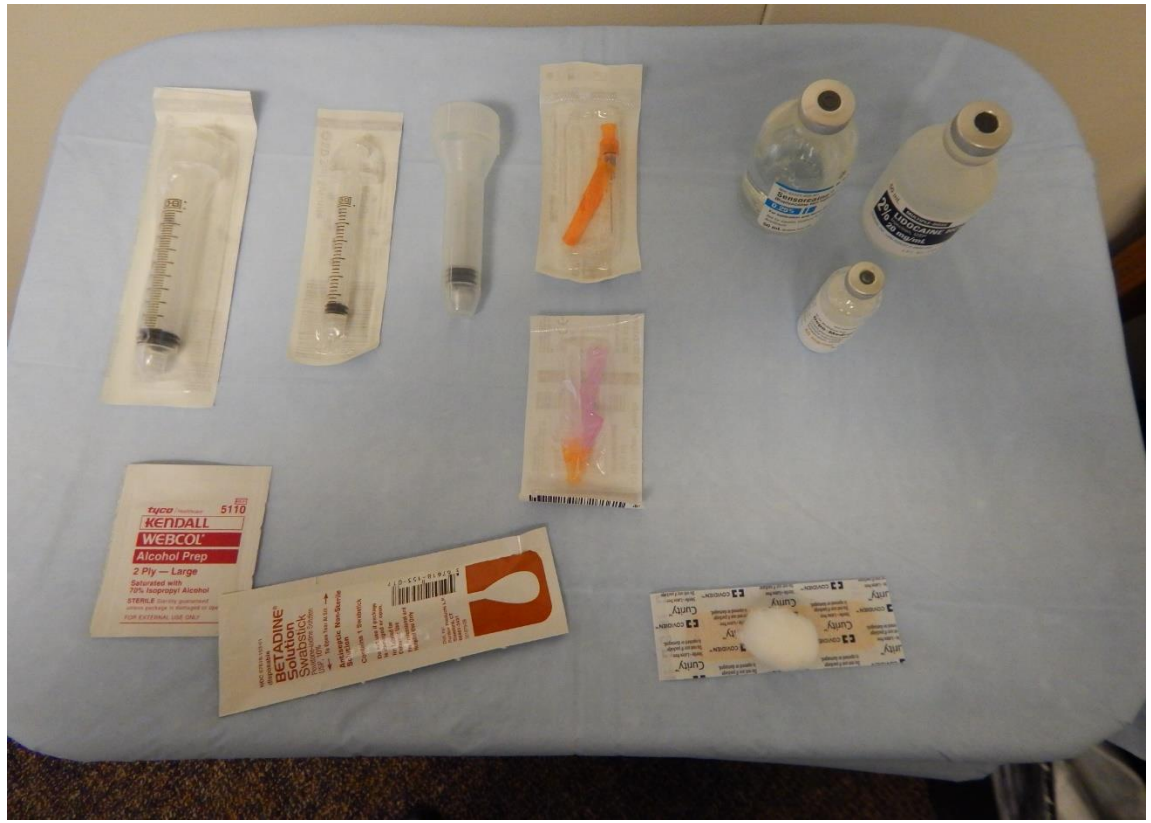
- Injectable medications:
  - Generally local anesthetic and steroid
  - May require guidance
    - Nerve Stimulator
    - U/S
    - Flouroscopy
  - Break the cycle of pain
    - Peripheral nerve block
    - Joint injection
    - Muscle injection
    - Tendon injection

Common Medications Use



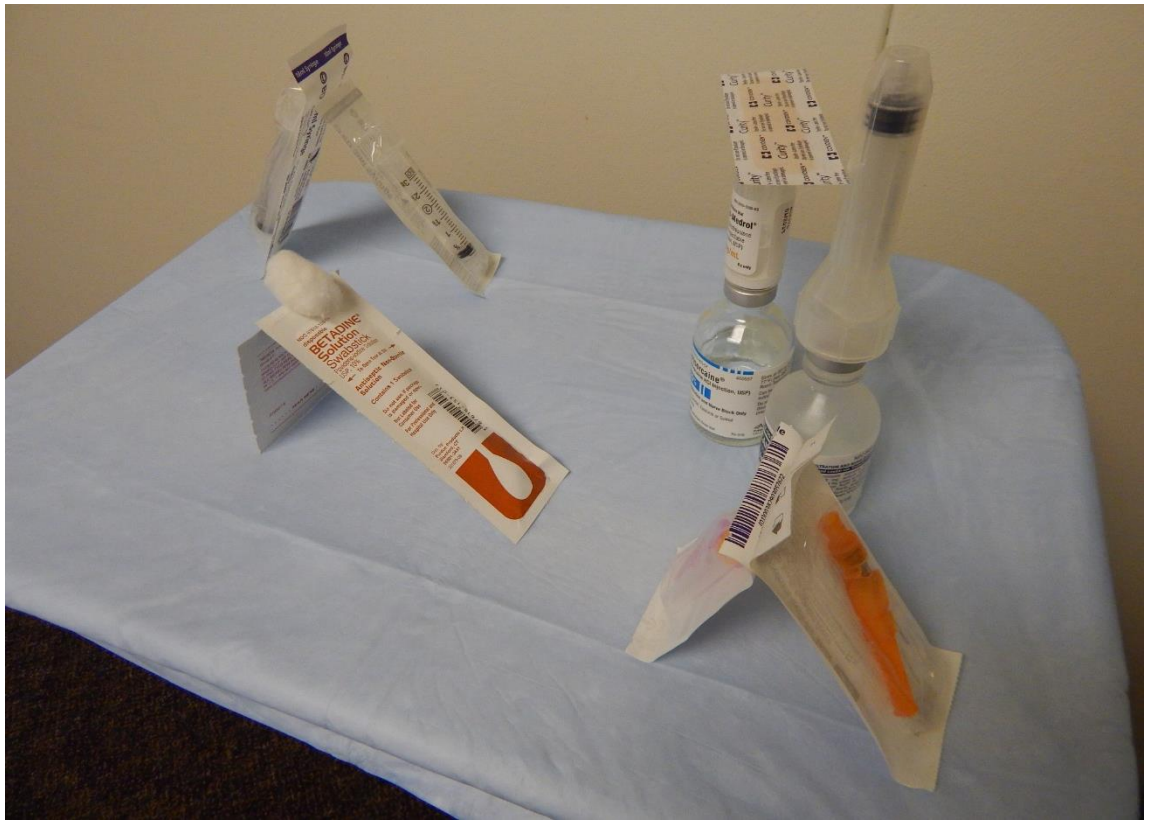
- Triamcinolone
- Bupivacaine
- Ethyl Chloride topical anesthetic
- Lidocaine
- Methylprednisolone
- Betadyne

Common Set UP



- Syringes
- Needles
- Medication
- Alcohol
- Betadyne
- Band-aids
- Cotton Balls

Not-so-common Set Up



- When your staff has too much time on their hands.

Treatment – Musculoskeletal Injections

- Joint, tendon, muscle
- Decrease pain with local anesthetics
- Decrease inflammation with steroids
- Improve lubrication of joint with viscosupplementation, artificial synovial fluid

Injection of painful lipoma

Injection of muscle trigger point

Injection of enthesis, ligament attachment to bone.

Injection of rotator cuff tendons

Injection of shoulder

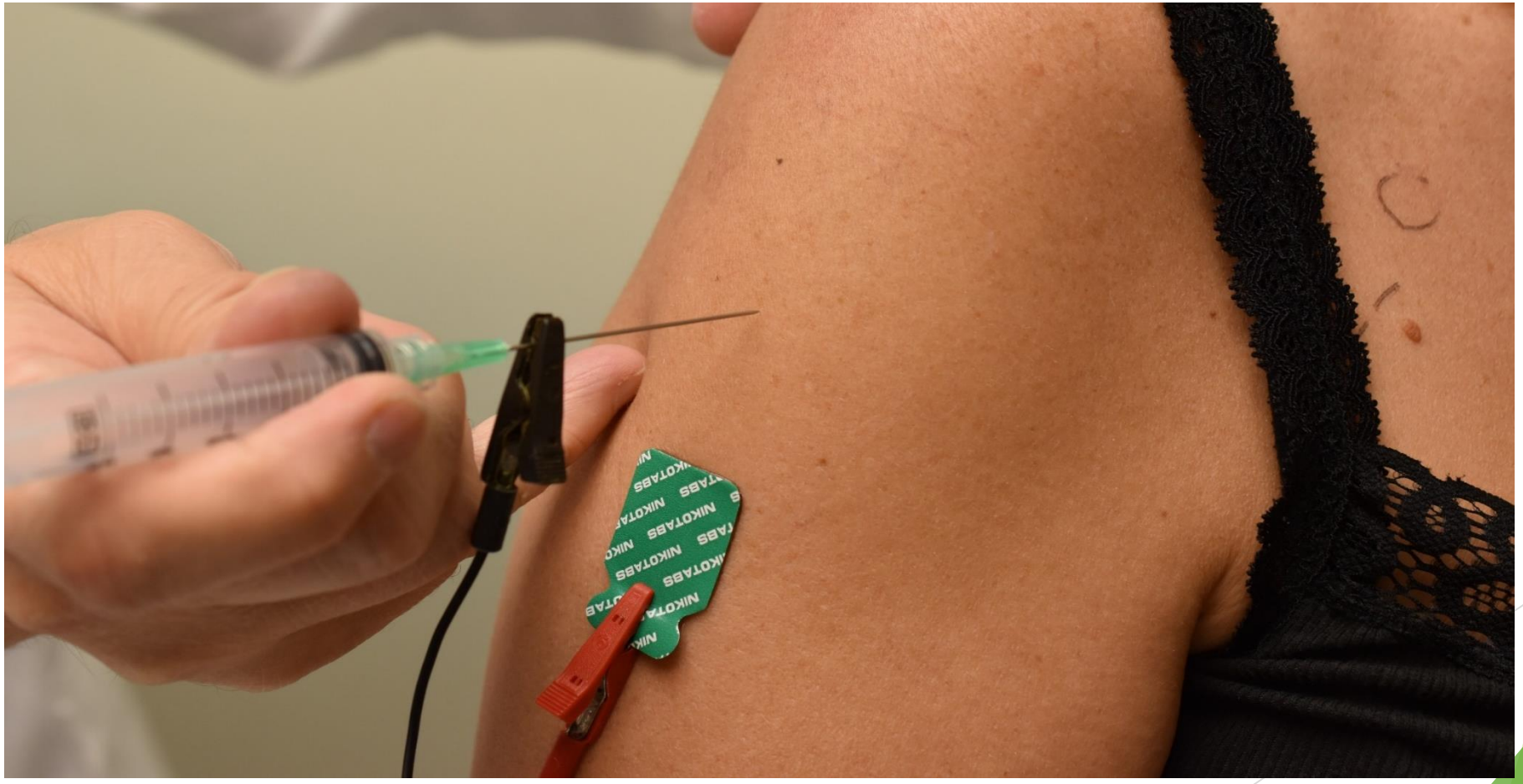
Treatments – Nerve blocks

- Block sensory fibers with anesthetic to decrease painful sensation and allow movement with less pain.
- Requires knowledge of surface anatomy for nerve pathways or
- Requires use of nerve stimulator or ultrasound to localize nerve.
- Sphenopalatine blocks to decrease migraine headaches.
  - Small amounts of local anesthetic placed on a cotton tip applicator
  - Inserted into nose between superior & middle turbinates
  - Left in for 15 mins + to numb the Sphenopalatine ganglion and break the migraine headache.
  - 70+% improvement.

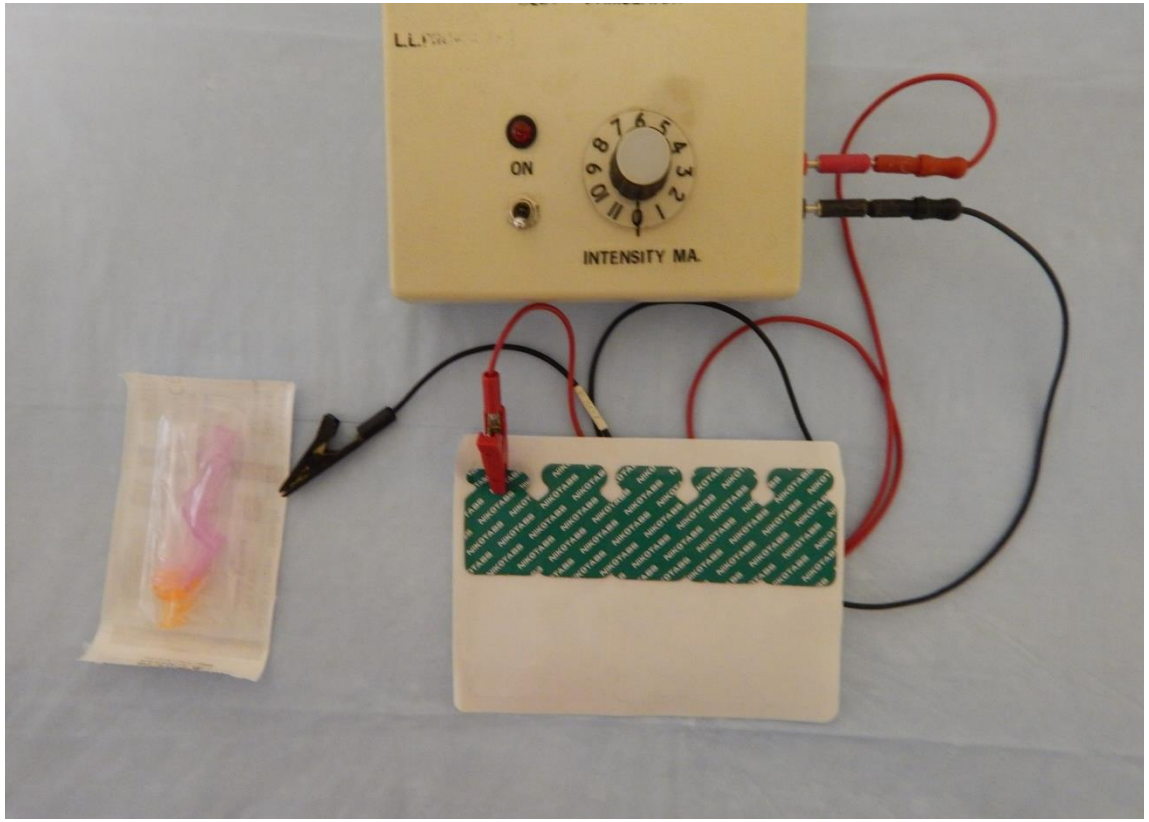
Treatments – Spasticity - Neurolysis & Chemodenervation

- Used to decrease spasticity.
- Spasticity causes pain from muscle/tendon pull on periosteum and building up of metabolic waste products, as lactic acid, in muscles.
- Spasticity can block muscle action which is under voluntary control, decreasing functional re-training and improvement.
- Decrease in ROM from the spasticity sets up joint contractures which may then be a stimulus to more spasticity.
- Neurolysis – Chemical destruction of nerve branch to spastic muscle. Inject Phenol or absolute alcohol.
- Chemodenervation – Blocks re-uptake of Ach at the myoneural junction, causing muscle relaxation. Inject botulinum neurotoxin.

Injection of Axillary nerve in shoulder at deltoid muscle using nerve stimulator



Nerve stimulator using needle electrode and surface connector



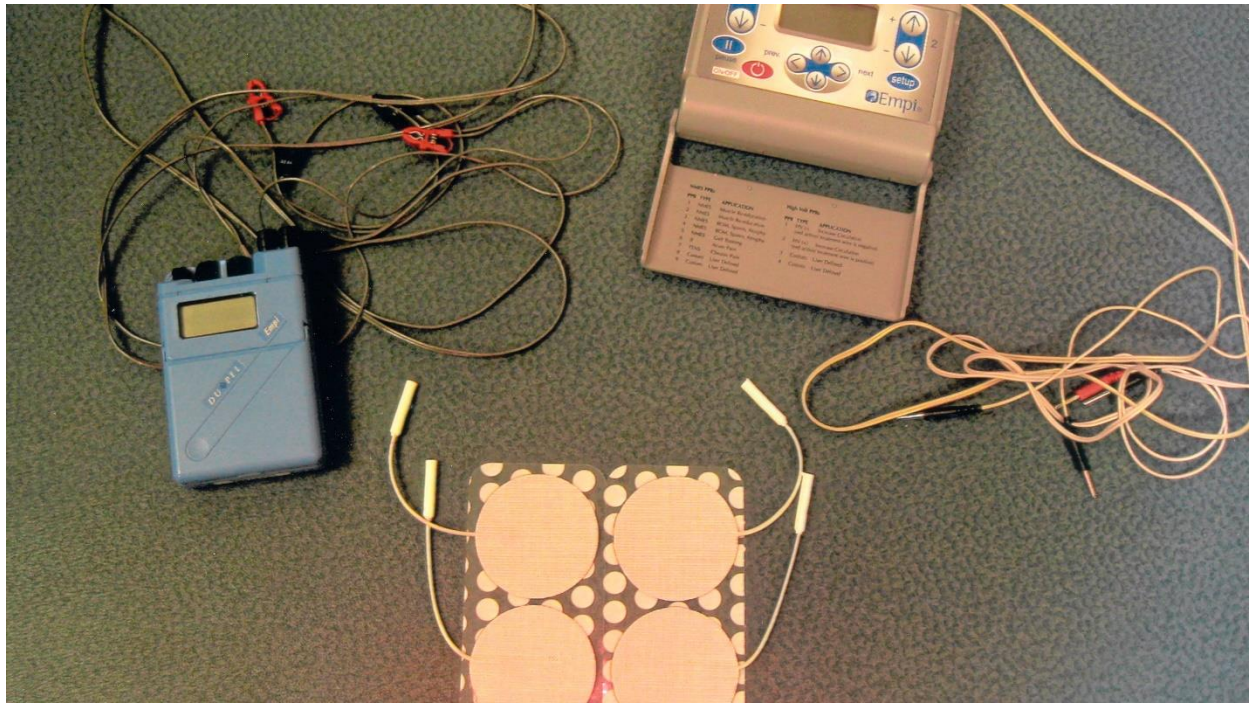
- Needle electrode and surface electrodes make a circuit
- When the needle comes close to the nerve, the muscle will contract due to stimulation from the stimulator
- For sensory nerves, the patient will feel small shock in distribution of nerve

Physical Therapy

- Used to improve physical effects (spasm, joint contractures, weakness, etc.) of accidents and illnesses, and thereby decrease pain complaints.
- Therapeutic exercises – Improves flexibility, range of motion, strength & endurance, and functional mobility as walking, lifting & carrying, etc.
- Ultrasound – Superficial heating modality to loosen joint capsules and allow for greater range of motion with prolonged stretching.
- Electrical muscle stimulation/Transcutaneous Electrical Nerve Stimulation (TENS) – Superficial stimulation of the muscles to decrease spasm, increase muscle relaxation and decrease pain.

Ultrasound Unit

Electrical Muscle Stimulation/Transcutaneous Electrical Nerve Stimulator



Complementary & Alternative Medicine (CAM)

- Treatments and techniques used to improve mobility and pain complaints.
- Non-mainstream approaches to the patients.
- These techniques include:
  - Nutraceuticals
  - Osteopathic Manipulative Medicine
  - Medical Acupuncture
  - Prolotherapy

Nutraceuticals

- Research being done on many Herbal Nutraceuticals.
- National Institute for Complementary & Integrative Health supports research and has listing of what is known for many of these treatments.
- Migraine Headaches
  - Butterbur, Feverfew, Mg++, Coenzyme Q10, Riboflavin
- Msk Inflammation
  - Turmeric, Bromelian, Willow Bark, Omega-3 Fatty Acids, Devil's Claw, Ginger, Thunder God Vine
- Osteoarthritis
  - Glucosamine, Chondroitin sulfate

Treatments – Osteopathic Manipulative Medicine

- OMM
  - Decrease muscle spasm
  - Improve joint mobility
  - Improve blood flow
  - Decrease swelling
  - Desensitize peripheral nerve pain

Treatment – Osteopathic Manipulative Medicine

- Craniosacral Therapy – Very good for post-traumatic headaches
- Visceral Manipulation – Improve GI motility
- Direct Techniques – Take the joints and muscles to the area of tightness (barrier) and move though the barrier
  - Muscle energy or Contract/Relax
  - Myofascial Release
- Indirect Techniques – Take the joints and muscles away from the area of tightness (barrier) and hold to allow relaxation
  - Counterstrain

- Osteopathic Manipulative Medicine to low back for musculoskeletal pain complaints

Treatments – Medical Acupuncture

- Medical Acupuncture
  - Locally break muscle spasm mechanically
  - Low Frequency – High Amplitude
    - For acute musculoskeletal pain complaints
    - Stimulates endorphin production
    - 2 – 8 Hz, strong as tolerable
  - High Frequency – Low Amplitude
    - For chronic pain complaints, depression and substance abuse
    - Stimulates serotonin production
    - 300 – 3000 Hz, low level buzzing sensation

Medical acupuncture

- Multiple needles in an array to treat muscle and joint pain.

- Stimulator for acupuncture needles to increase the effect of the needling, obtain more analgesic and muscle relaxation effect.

Treatment - Prolotherapy

- Injecting small amount of anesthetic and a sclerosing substance to cause localized fibrosis or scar at bone to tendon, ligament and joint attachments.
- Decreases hypermobility.
  - Chronic strain
  - Enthesopathy – painful tendon to bone attachment
  - Weakened ligaments
- Decreases pain of hypermobility

Value added service

- OMM for vocal performance.

Suggested treatment for voice and swallowing

- Research project
- 50 subjects randomly chosen
- Tested cervical ROM then speech recorded – “aaa” & “eee”
- Treated w/ OMM to neck & upper trunk
- Speech recorded again and then cervical ROM tested again

Results

- Cervical ROM improved with OMM, as was expected.
- 80+% of subjects improved in vocal parameters, by analysis of the recordings.
- The techniques used were primarily Myofascial Release Techniques (soft tissue stretching) of the various muscles around the upper airway.

Manual Techniques to Decrease muscle Spasm and Pain

- With these techniques have patient supine on exam table.
- Sit or stand at the head of the table.
- **Always explain to patient what you are about to do and why.**
- Use gentle pressure, not large force.
- Move muscles in cephalad-caudad, anterior-posterior, and anterior-posterior rotation, or parallel or perpendicular to the fiber directions, from easily moved to tightened “barrier” position.
- Never push to the point of pain, only stretching.
- Hold as patient takes 3 – 5 slow breaths to allow the muscles to relax.
- Repeat the process 3 – 4 time to get maximum relaxation in the muscles.

Masseter Release

- Patient supine on table.
- Sit or stand at head, placing fingers on each side of jaw.
- Compress masseters and add pressure in anterior-posterior, cephalad-caudad and anterior-posterior rotation directions to feel the muscles tighten to barrier.
- Hold for several breaths to allow the muscles to relax.
- Shift fingers to tighten again and repeat.
- Repeat 3 – 4 times to fully relax muscles.

Sternocleidomastoid Stretch

- Patient supine on table.
- Sit or stand at head, placing one hand supporting the head and the other with fingers behind the SCM.
- Compress SCM and add pressure in anterior-posterior, cephalad-caudad and anterior-posterior rotation directions to feel the muscles tighten to barrier.
- Hold for several breaths to allow the muscles to relax.
- Shift fingers to tighten again and repeat.
- Repeat 3 – 4 times to fully relax muscles.
- Repeat on opposite side, if needed.
- Do not come from in front of SCM to avoid carotid artery pressure.

Upper Trapezius Stretch

- Patient supine on table.
- Sit or stand at head, placing one hand supporting the head under the occiput and the other with hand on the shoulder at the lateral end of the trapezius.
- Slightly flex the neck to tighten the trapezius to barrier.
- Stretch the trapezius with pressure on the top of the shoulder & with pressure on the head toward the contralateral side. Hold for several breaths to allow the muscles to relax.
- As the muscle relaxes, continue the pressure aiding the muscle stretching.
- Repeat 3 – 4 times to fully relax muscles.
- Repeat on opposite side, if needed.

Platysma Stretching

- Patient supine on table.
- Sit or stand at head, placing fingers of both hands under & medial to the anterior aspect of the jaw.
- Compress Platysma and add pressure in a cephalad direction and add anterior-posterior and rotation directions to feel the muscles tighten to barrier.
- Hold for several breaths to allow the muscles to relax.
- Shift fingers to tighten again and repeat.
- Repeat 3 – 4 times to fully relax muscles.
- Do not compress under the angle of the jaw to avoid carotid artery pressure, or midline to avoid the trachea and larynx.

Anterior Pectoralis Stretching

- Patient supine on table.
- Sit or stand at head, placing fingers on each side of upper chest at the pectoralis.
- Compress pecs and add pressure in anterior-posterior, cephalad-caudad and right-left rotation directions to feel the muscles tighten to barrier.
- Hold for several breaths to allow the muscles to relax.
- Shift fingers to tighten again and repeat.
- Repeat 3 – 4 times to fully relax muscles.
- Maintain hands at top of chest, superior to breast tissue & nipple line.

Lateral Pectoralis Stretch

- Patient supine on table.
- Sit or stand at head, placing fingers on each side of upper chest at the anterior axillary folds at the lateral part of the pectoralis muscles.
- Compress pecs with fingers from inferior aspect of anterior axillary folds and add pressure in anterior-posterior, and cephalad-caudad directions to feel the muscles tighten to barrier.
- Hold for several breaths to allow the muscles to relax.
- Shift fingers in cephalad direction to tighten again and repeat.
- Repeat 3 – 4 times to fully relax muscles.
- Maintain hands at anterior axillary folds lateral to breast tissue.

Lower Trapezius & Thoracic Paraspinal & Rhomboid Stretch

- Patient supine on table.
- Sit or stand at head, placing fingers on each side of upper chest from under patient.
- Compress the muscles and add pressure in anterior-posterior, cephalad-caudad and right-left rotation directions to feel the muscles tighten to barrier.
- Hold for several breaths to allow the muscles to relax.
- Shift fingers to tighten again and repeat.
- Repeat 3 – 4 times to fully relax muscles.

Suggestion

- Utilize these techniques to improve
  - Vocal output
  - Swallowing ability

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