EXERCISE-INDUCED ANALGESIA via Meditative Movement Therapy

OBJECTIVES: Upon completion of this session, the participant will be able to:

1. Differentiate acute vs. chronic pain.
4. Prescribe PT interventions for pain management including: 1) aerobic exercise, 2) strengthening, 3) flexibility, 4) functional (neuro-muscular re-education).
5. Define meditative movement therapy (MMT).
6. Describe the mind-body, biomechanical, biomedical and functional benefits of tai chi for the client with chronic pain.
7. Comprehend the components of the Tai Chi Fundamentals® (TCF) Program.
8. Apply tai chi mind-body principles and TCF movement patterns for functional training for the client with chronic pain.

I. BACKGROUND (PPT slides 1-29)

A. PAIN is a Normal Part of Life

1. We previously established that nociception and the pain response serves a vital function as a warning sign of injury (tissue damage) or infection, aka “is a normal physiologic process,” but once its warning role is over, continued pain is maladaptive.

2. Nociception (ascending) is an input to the Brain and Pain (descending) is an Output of the Brain

3. Prediction Rules in Acute and Chronic Pain (Steve George, APTA CSM, Indianapolis, 2015)

<table>
<thead>
<tr>
<th>ACUTE PAIN</th>
<th>CHRONIC PAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause is generally known (e.g. acute injury, infection)</td>
<td>Cause is multi-factorial (biopsychosocial)</td>
</tr>
<tr>
<td>Duration of pain is typically short, well-characterized</td>
<td>Pain persists after healing, ≥ 3 months</td>
</tr>
<tr>
<td>Treatment the acute cause</td>
<td>Treatment is multifactorial</td>
</tr>
</tbody>
</table>

_The development of chronic pain is often the result of the ‘perfect storm’ of multiple inputs (biopsychosocial factors)._
4. Fear Avoidance Model of Chronic Pain

B. Factors Associated with the Development of Chronic Pain (Table 1-1, IOM Report, 2011)

TABLE 1-1 Life-Cycle Factors Associated with the Development of Chronic Pain*

<table>
<thead>
<tr>
<th>From Birth</th>
<th>Childhood</th>
<th>Adolescence</th>
<th>Adulthood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetics, female sex, minority race or ethnicity, congenital disorders, prematurity</td>
<td>Parental anxiety, irregular feeding and sleeping</td>
<td>Parents’ pain exposure and reactions</td>
<td>Temperament and personality</td>
</tr>
</tbody>
</table>

- Physical/sexual abuse and other traumatic events (e.g., death of a parent, witness to violence)
- Low socioeconomic status
- Emotional, conduct, and peer problems
- Hyperactivity
- Serious illness or injury, hospitalization
- Separation from mother
- Acute or recurrent pain experience

![Diagram](image)

- Changes of puberty, gender roles
- Education level, learning (behavioral reactions to pain)
- Injuries
- Obesity
- Low levels of fitness

![Diagram](image)

- Vivid recall of childhood trauma
- Lack of social support, accumulated stress (“allostatic load”)
- Surgery
- Overuse of joints and muscles
- Occupational exposures, job dissatisfaction, low work status
- Development of chronic disease
- Aging

*NOTE: These factors are discussed later in this chapter and in Chapter 2.
C. Factors Associated with the Persistence of Pain

1. ISAP says, Persistent musculoskeletal pain is fueled by worldwide trends, including:
   a. Aging populations (in the USA this represents the baby boomers coming of age)
   b. Lifestyles factors (e.g. physical inactivity, nutrition, sleep hygiene, smoking, ETOH, etc.)
   c. Increasing incidence of obesity (http://www.who.int/mediacentre/factsheets/fs311/en/)
      1) Worldwide obesity has more than doubled since 1980.
      2) In 2014, more than 1.9 billion adults, 18 years and older, were overweight (BMI 25-29.9). Of these over 600 million were obese (BMI > 30).
      3) Most of the world's population live in countries where overweight and obesity kills more people than underweight.
      4) More than one-third (34.9% or 78.6 million) of U.S. adults are obese.
   d. Certain health conditions (e.g. FMS, arthritis, depression, anxiety, mood disorders)
   e. Other risk factors include stress, relationship problems, or a history of physical, sexual, or emotional abuse.
   f. Kinesophobia – the fear of movement (yellow flags)
   g. Other “Flags” for Chronic Pain (e.g. biomedical, psychiatric, socio-economic and occupational factors)


D. Principles of Pain Management (Box S-1, IOM Report, 2011)

Effective pain management is a moral imperative, a professional responsibility, and the duty of people in the healing professions.
Principles of Pain Management (IOM Report, 2011)

BOX S-1
Underlying Principles

- **A moral imperative.** Effective pain management is a moral imperative, a professional responsibility, and the duty of people in the healing professions.
- **Chronic pain can be a disease in itself.** Chronic pain has a distinct pathology, causing changes throughout the nervous system that often worsen over time. It has significant psychological and cognitive correlates and can constitute a serious, separate disease entity.
- **Value of comprehensive treatment.** Pain results from a combination of biological, psychological, and social factors and often requires comprehensive approaches to prevention and management.
- **Need for interdisciplinary approaches.** Given chronic pain’s diverse effects, interdisciplinary assessment and treatment may produce the best results for people with the most severe and persistent pain problems.
- **Importance of prevention.** Chronic pain has such severe impacts on all aspects of the lives of its sufferers that every effort should be made to achieve both primary prevention (e.g., in surgery for a broken hip) and secondary prevention (of the transition from the acute to the chronic state) through early intervention.
- **Wider use of existing knowledge.** While there is much more to be learned about pain and its treatment, even existing knowledge is not always used effectively, and thus substantial numbers of people suffer unnecessarily.
- **The conundrum of opioids.** The committee recognizes the serious problem of diversion and abuse of opioid drugs, as well as questions about their long-term usefulness. However, the committee believes that when opioids are used as prescribed and appropriately monitored, they can be safe and effective, especially for acute, postoperative, and procedural pain, as well as for patients near the end of life who desire more pain relief.
- **Roles for patients and clinicians.** The effectiveness of pain treatments depends greatly on the strength of the clinician–patient relationship; pain treatment is never about the clinician’s intervention alone, but about the clinician and patient (and family) working together.
- **Value of a public health and community-based approach.** Many features of the problem of pain lend themselves to public health approaches—concern about the large number of people affected, disparities in occurrence and treatment, and the goal of prevention cited above. Public health education can help counter the myths, misunderstandings, stereotypes, and stigma that hinder better care.

1. Managing Pain: **The 5-step Approach**
   a. Medications (medical management)
   b. Explore how thoughts and emotions are affecting the nervous system (mind-body principles)
   c. Recognize the role of diet and lifestyle (e.g. smoking, alcohol, sleep hygiene, activity levels) play in sensitizing the nervous system
   d. Explore the deeper meaning of pain and personal stories; did a worrying period of life contribute to the overall pain picture?
   e. Physical activity and function (exercise is medicine)

2. Physical Therapy is the first-line of defense for management of pain. Persons with chronic pain, need a multi-modal approached and follow the chronic pain treatment continuum (see below).

The chronic pain treatment continuum *incorporates* the original World Health Organization (WHO) analgesic ladder analgesic ladder (pictured below). The analgesic ladder (1986) pertained specifically to the management of cancer pain. The original analgesic ladder had three tiers: Tier 1 (nonopioid analgesics and NSAIDs), Tier 2 (weak opioids) and Tier 3 (strong opioids). Over the years, chronic pain has been incorporated into the ladder. Subsequent models, like the one below (LEFT), include other interventions (e.g. physical therapy, cognitive behavioral therapies, TENS, mobilization and interventional procedures).

![The Chronic Pain Treatment Continuum](http://www.paingujarat.com/chronic_pain.html)

UNDERSTANDING PAIN: What to do about it in less than five minutes.
http://www.youtube.com/watch?v=4b8oB757DKc

E. Psychologically Informed Physical Therapy Practice for the Management of Chronic Pain

1. Identify reason for consulting health care and expectations of outcomes (Why are you here?)
   a. PTs typically ask for specific FACTS in a Subjective Interview: 1) location of pain, 2) description of pain, 3) behavior of pain (e.g. aggravating, alleviation and 24-hour report), 4) mechanism of injury and review of systems
   b. Don’t forget to ask how they feel about the situation, how confident they feel the situation will change (self-efficacy). Motivational interviewing strategies are helpful to this process.

2. Assess beliefs about pain (e.g. fear-avoidance, pain catastrophizing, self-efficacy, coping skills and support [home, work, friends, financial]). RECOMMENDED OUTCOME TOOLS:
   a. Tampa Bay Kinesophobia Scale (TKS) (Miller, Kori and Todd, 1991)
   b. Fear Avoidance Beliefs Questionnaire (FABQ) (Waddell, 1993)
      http://www.udel.edu/PT/PT%20Clinical%20Services/journalclub/caserounds/05_06/mar06/FABQ1.pdf
   c. Self-efficacy for Exercise (Resnick and Jenkins, 2000)
   d. US Department of the Veteran’s Administration – Outcomes Tool Kit for Pain
      www.va.gov/PAINMANAGEMENT/docs/Outcomes.doc
   e. Patient-Specific Functional Outcome Scale

3. Communication – patient-centered care with a salutogenic focus (see next page)

4. Use cognitive-behavioral principles (Nicholas & George. *Phys Ther* 2011;91:765-776)

Appendix.

Basic Cognitive-Behavioral Methods Used in Pain Management

1. Cognitive-behavioral analysis

   Observe when and where problem behaviors occur and their consequences for the patient.
   Identify beliefs and expectations associated with problem behaviors (e.g. catastrophizing).
   Develop a formulation of relationships between these domains (Figure).

2. Creation of cognitive-behavioral change plan (with patient’s involvement)

   Identify specific (behavioral) goals that the patient wants to achieve (goal setting).
   Break down goals into specific subgoals (e.g. walking time) that can be upgraded in steps (eg, “pacing up” by preset activity or time quotas).
   Develop a plan for dealing with likely obstacles (eg, at home and at work).
   Reinforce activities performed according to the plan.

3. Implementation of plan

   Explain to and discuss with the patient the formulation for problem behaviors and experiences (including pain) and obtain the patient’s agreement.
   Ensure that the patient attempts activities previously avoided because of pain or fear of pain or reinjury, not just at the clinic but also at home and at work, using pacing quotas.
   Help the patient deal with obstacles to progress and setbacks.
   Provide skills training as needed (eg, identify and challenge unhelpful thoughts and beliefs).
   Monitor and reinforce (with charts or diaries) the performance of planned tasks.
   Terminate treatment when goals are achieved and provide a plan for dealing with relapses.
E. Psychologically Informed Physical Therapy Practice for the Management of Chronic Pain – cont.

5. Promote Salutogenesis via 3 Key Features of Communication
   
   Latin, salus = health + Greek, genesis = origin
   
   a. **Comprehensibility**: Understanding events in your life will help you handle the future
   
   b. **Manageability**: Self-efficacy; one has the skills, support & resources necessary to take care of things that are within your control
   
   c. **Meaningfulness**: Life has purpose and gives satisfaction; it is valuable to care about what happens


   **RELIEVE Mnemonic: Establishing a Healing-Oriented Encounter**

   - Relationship-centered care, built on
   - **Empathy** and trust creates a positive environment where the clinician can
   - **Listen** to the complicated story that creates
   - **Insight** into a problem that results in an
   - **Explanation** that is consistent with the patient’s
   - **Values** leading to
   - **Empowerment** and action towards health

7. Therapeutic Neuroscience Education (*Education is therapy*) – Refer to references enclosed

E. Psychologically Informed Physical Therapy Practice for the Management of Chronic Pain – cont.

8. Patient Education: Activation Philosophy: “PTs are Movement Experts”
   a. Anatomy
   b. Neuroanatomy
   c. Physiology
   d. Motor control
   e. Biomechanics

9. Patient Education: “Rest from Activity, not Function”
   a. Resumption of activities despite the presence of a chronic pain condition
   b. Return to more active-lifestyle despite pain
   c. Offer encouragement
   d. Empower change

10. Patient Education: “Shift Focus from Pain Relief to Pain Management”
    a. Pain is multi-faceted, so is treatment
    b. Avoid search for the source of symptoms: Diagnostic imaging only adds to healthcare costs and is not highly correlated to diagnosis/prognosis
    c. Avoid the search for the magic bullet: There is NO pain “off-switch” in the CNS

11. TREATMENT PLAN: “Graded Activity Approach”
    a. Graded exposure (for those with high fear)
    b. Graded exercise or activity
      1) Quota-based exercise (QBE) programs
      2) Proper use of motor-learning principles
      3) Kinesthetic cues to remap the somatosensory cortex
      4) Time needed to get tissue healthy again (blood flow)

Applying Exercise to Persons with Chronic Musculoskeletal Pain

- Exercise should be FUN, not a burden
- Discuss the content of exercise protocol with the patient, it should fit the needs and requests of the patient
- Use aerobic exercise as well as motor control training
- Be careful with eccentric (strengthening) exercise
- Include exercise of non-painful parts of the body
- Allow increased pain during and shortly following exercise but avoid continuously increasing pain intensity over time
- Use a time-contingent approach with appropriate baseline (QBE)
- Be conservative when setting the baseline
- Use multiple and long recovery breaks
- Monitor symptom flares, especially during initiation of treatment and during grading, and adopt exercise modalities accordingly
- Minor symptoms flares are natural during initial stages of exercise therapy, but should cease once and exercise routine is established

12. SUMMARY: Psychologically Informed Practice ©2011 by American Physical Therapy Association

THERAPEUTIC NEUROSCIENCE EDUCATION REFERENCES

Books

Journal Articles
II. PT INTERVENTIONS FOR PAIN MANAGEMENT
A. Stop Managing Pain and Foster Lifestyle Factors that Influence OPTIMAL HEALTH & WELLNESS (PPT slides 30-48)
   1. Key Principles of Fostering Optimal Wellness
      a. Enhanced self-awareness and knowledge of healthy habits
      b. Willingness to change behaviors that interfere with good health
      c. Create nurturing of environments that support positive health practices

FROM: www.wellpeople.com

B. Dimensions of Wellness : Resources for Establishing Baseline Wellness in your Patients/Clients
   1. What are the dimensions of wellness?
   2. What is CORE to the system?
   3. Assessing the multiple dimensions of wellness in your clients

Historically, PT focus has been the evidenced-based practice of the PHYSICAL DIMENSION, but 21st century literature is taking us to the other dimensions of wellness.
C. EXERCISE: Why so Relevant?

1. Aerobic exercise, strengthening, flexibility and functional (neuromuscular) are INDICATED for persons with chronic pain to improve function (Durstine, ACSM 2009)
2. Muscle contraction can act as a pain-rate via endorphin relief (e.g. “runner’s high”).
3. Improve posture – increased core body, shoulder girdle, pelvic girdle and leg strength help sitting & standing posture.
4. Improve flexibility/strength so that the zone of safe function is enhanced.
5. Prevent falls – enhances neuromuscular coordination
6. Boosts the Immune System
7. Prevent and/or treat other health conditions (e.g. stroke, diabetes, HTN, cancer, Alzheimer’s depression, etc., etc.)

FROM: The Cancer War (2014)

YouTUBE Video: Q: 23½ hours: What is the single best thing we can do for our health? A: 30 minutes of exercise (physical activity) Available at: http://www.youtube.com/watch?v=aUalnS6HlGo

1. PA Guidelines vary slightly across the lifespan
   At-a-Glance Fact Sheet (great handout) [http://www.health.gov/paguidelines/factsheetprof.aspx](http://www.health.gov/paguidelines/factsheetprof.aspx)

2. Children and Teens (0-18 years)
   a. **AEROBIC** = 60+ minutes per day moderate- or vigorous-intensity PA; vigorous-intensity 3x per week
   b. **MUSCLE STRENGTH** = 3x per week (BW resistance; calisthenics; tug-of-war)
   c. **BONE STRENGTH** = 3x per week (jumping sports, jump rope, gymnastics)

3. Adults
   a. **AEROBIC** = At least 150-min of moderate-intensity/week OR 75-min of vigorous-intensity per week performed at least 10-minute bouts at a time
   b. **MUSCLE STRENGTH** — 8-10 major groups 2x/week, 70% Rep-max, 8-12 x 2sets
   c. **OLDER ADULTS** (65+ years) need to add exercises for BALANCE (fall prevention)*

**E. Exercise for Chronic Pain: What should we do?**

1. **ACSM: Categories of Exercise for Persons with Chronic Pain**
   a. Aerobic - goal is the National PA guidelines; may need more gradual increase
   b. Strength Training - goal is the National PA guidelines; may need lower RM for intensity
   c. Flexibility† (unique to the client with pain)
   d. Functional (neuromuscular control)* is added at any age

2. **Why is Flexibility added for the client with chronic pain?**
   a. Mobility is the first stage of motor control
   b. Mobility impairments of any sort can limit function and should be treated
   c. Persons with chronic pain can have all sorts of mobility limitations
      1) Muscle flexibility – dynamic (contractile elements) and static (non-contractile component of muscle) limitations
      2) Joint mobility (JPA) – inert restrictions of joint capsules and ligaments
      3) Neural dynamics / neural adhesions (s/p injury or surgery)
      4) Fascial restrictions (integument and other layers of fascia)
      5) Visceral restrictions
      6) Surgical adhesions
      7) Fear of movement

3. **Why are functional neuro-muscular re-education exercise added for the client with chronic pain?**
   a. CHRONIC PAIN CHANGES THE BRAIN: Patients with chronic pain have altered nervous systems (somatosensory cortex re-mapping is required because their brains are ‘smudged’)
      A PubMed search of “chronic pain and central nervous system” yields 61 systematic reviews in last 5 years linking neurophysiologic central nervous system changes to numerous chronic pain states (e.g. LBP, neck pain, whiplash, OA, FBSS, pelvic pain, FMS, PTSD, MS, migraine, etc., etc.)
   c. Functional (neuromuscular control) exercises should be added to the exercise program of any client with chronic pain no matter what the age!
   d. Balance is not just for persons >65 years of age. The new iteration of National PA Guidelines should include functional (neuromuscular control) exercises for everybody! (OPINION: Hallisy)

4. Furthermore, mind-body practices of some sort are required to re-map the central nervous system ([https://nccih.nih.gov/video/series/mindbody](https://nccih.nih.gov/video/series/mindbody))
III. TAI CHI AS A MEDITATIVE MOVEMENT THERAPY FOR CHRONIC PAIN

“Tai chi, which originated in China as a martial art, is a mind and body practice. Tai chi is sometimes referred to as “moving meditation”—practitioners move their bodies slowly, gently, and with awareness, while breathing deeply.”  

A. Meditative Movement Therapy (Larkey, 2009)
1. A new category of exercise defined by: 1) some form of movement or body positioning, 2) a focus on (diaphragmatic) breathing and 3) a calm state of mind with the GOAL of deep states of relaxation
2. Types of Meditative Movement Therapies
   a. Tai chi chuan – our focus today!
   b. Qigong
   c. Yoga
   d. Meditation
   e. Feldenkrais Method®
   f. Alexander Technique®
3. “Mind and body practices—such as tai chi, yoga, and meditation—focus on the interactions among the brain, mind, body, and behavior, with the intent to use the mind to affect physical functioning and promote health.” (NCCIM, 2015: https://nccih.nih.gov/video/series/mindbody)
4. Mind-Body Interactions: Feedback loops between pain, emotions and cognition

Nature Reviews | Neuroscience

Nature Reviews Neuroscience 2013;14:502–511

5. What does Tai Chi do?
   a. Trains efficient, effective use of mental & physical energy
      1) Fosters a relaxed, alert state of mind
      2) Optimizes efficiency of movement
      3) Promotes appropriate decision making
      4) Reduces potential for physical injury
      FROM: Tai Chi Mind and Body, Tricia Yu (DK Publishing) 2003
   b. There is growing evidence that Tai Chi has value in treating or preventing a wide range of health problems (just do a PubMed literature on Tai chi and find out why I can’t keep up)
6. Tai Chi is Evidenced-Based: Search Strategy – “tai chi” on March 17, 2015

5. Key findings
- 1,389 articles (713 in past 5 years)
- 186 RCTs (89 in past 5 years)
- 184 systematic reviews (144 in past 5 years)
- 44 meta-analyses (35 in past 5 years)
- 3 practice guidelines (FMS x2; OA x1)

6. Convincingly positive evidence for:
   1) Fall prevention
   2) Improvement of psychological health
   3) General health benefits for older people
      ✓ Chronic health conditions
      ✓ MSK and neurologic conditions
      ✓ Function, PAIN, Strength
      ✓ CV health

Veteran’s Administration Tai Chi Evidence Map

Tai chi can impact at all levels of the WHO ICF-Model.
Just do a literature search in PubMed “tai chi and _____” and you will likely get an article, on your topic of interest. But like all science, we can’t guarantee it will be a good study. Hard to do RCTs on Tai Chi because, really what is SHAM tai chi?
7. PubMed search “Tai Chi and Pain” (performed 3/25/2104)

<table>
<thead>
<tr>
<th>ARTICLE TYPE</th>
<th>Total N = 152</th>
<th>Last 5 years N = 96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randomized Control Trials</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>Reviews</td>
<td>54</td>
<td>38</td>
</tr>
<tr>
<td>Systematic Review</td>
<td>41</td>
<td>28</td>
</tr>
</tbody>
</table>

**CONFLICTING DATA DOES EXIST**

- Meditative movement therapies are strongly recommended for pain management
- The quantity and the quality of CAM pain research studies are inconsistent; better RCTs are needed

**SAMPLES FROM THE LITERATURE**

- Tai Chi contributes to pain management in 3 major areas: 1) adaptive exercise, 2) mind-body interaction, and 3) meditation
- Tai Chi seems to be an effective intervention for OA, LBP, FMS, less evidence for RA and HA.

- A total of 7 out of 117 studies, 362 subjects and a median of 12 sessions (range 8-24) were included.
- MMT reduced sleep disturbances, fatigue, depression and limitations of health-related quality of life, but not pain compared to controls at final treatment. MMT are safe.

- N = 7 RCTs with 348 patients with OA
- CONCLUSION: Twelve-week Tai Chi is beneficial for improving arthritic symptoms (pain, stiffness) and physical function in patients with osteoarthritis and should be included in rehabilitation programs. However, the evidence may be limited by potential biases; thus, larger scale randomized controlled trials are needed to confirm the current findings and investigate the long-term effects of Tai Chi.

- 5 RCTs with 252 patients with knee OA
- CONCLUSION: Moderate evidence for short-term improvement of pain, physical function and stiffness in patients with osteoarthritis of the knee practicing Tai Chi. Tai Chi therapy was not associated with serious adverse events.

8. Tai Chi is SAFE (even for folks with chronic pain)


153 eligible RCTs identified; mostly older adults

* DATA SYNTHESIS: There were 153 eligible RCTs identified; most targeted older adults. Only 50 eligible trials (33%) included reporting of AEs; of these, only 18 trials (12% overall) also reported an explicit AE monitoring protocol.
* CONCLUSION: TC is unlikely to result in serious adverse events, but it may be associated with minor musculoskeletal aches and pains (e.g. knee and back pain). However, poor and inconsistent reporting of AEs greatly limits the conclusions that can be drawn regarding the safety of TC.
* OPINION (Hallisy): Because Tai Chi practice encompasses exercises that promotes posture, flexibility, mental concentration, and is done in slow, and controlled fashion, it is **SAFE** for patients with chronic health conditions to perform (Here is my evidence).
B. Tai Chi for Chronic Pain Conditions (UW-Health Tai Chi Classes for Chronic Conditions)

1. Movement Awareness & Exercise Class for Patients with Chronic Conditions
   a. Group Exercise Physical Therapy Class – est. 2007 (Hallisy), 2010-present (Houdek)
   b. Part of the multi-disciplinary pain management clinic (MD, Psychology, PT)
   c. Based on Tricia Yu’s Tai Chi Fundamentals® Program

2. Wide Range of Participants (N ≅ 200)
   a. Gender: Female > Male
   b. Age: 11 – 90 years

3. Sample Diagnoses (including but not limited to...)
   a. Chronic musculoskeletal pain (LBP, OA, FMS, etc.)
   b. Neurologic Diagnoses: PD, MS, Stroke
   c. Pelvic floor dysfunction
   d. Juvenile Rheumatoid Arthritis and Adult RA
   e. Lower limb amputation

4. Referrals from many sources...
   a. Primary Care Physicians
   b. Orthopedic MDs/DOs
   c. Veteran’s Administration MDs
   d. Pain Clinic
   e. Integrative Medicine Clinic
   f. Primary Care PTs & OTs
   g. Past clients

5. CLASS FORMAT
   a. Participants = 6 participants per class
   b. Visits = 5-, 6-, 8- or 10-session formats
   c. 60 minutes of exercise
      1) Warm-up, Training, Cool-down
      2) Mind/body skills practice
      3) TCF® movement patterns
      4) TCF® form practice
   d. Home training (DVD optional) and community resources

6. Short-Term Outcomes - Documented in Individual Medical Records
   a. Improved weight-bearing tolerance (monitored by number of seated rest breaks and overall
      time seated/lying down per exercise session)
   b. Improved single-leg standing balance
   c. Improved leg strength & transfers (Chair test)
   d. Decreased pain ratings over single treatment and over the course of the training sequence
   e. Outcome tools (e.g. TUG, DGI, ABCs, FMS impact scale, Oswestry, etc.) based on diagnosis

7. DOCUMENTATION – Each group class session utilizes templated EMR notes

8. BILLING – Group
   a. Neuromuscular Re-education (#1)
      * Balance, coordination, kinesthetic sense, posture, and/or proprioception
   b. Therapeutic Exercise (#2)
      * ROM, Strength Training, Aerobic capacity
   c. Postural & Balance Training
IV. TAI CHI FUNDAMENTALS® PROGRAM (Tricia Yu, Creator)

http://www.taichihealth.com

A. BACKGROUND

The Tai Chi Fundamentals® Program (TCF) is a medically-based tai chi program developed in collaboration with physical therapists in the late 1990’s. As such, this program is based on a developmental progression designed to provide the practitioner with sequential success in learning more complex movement patterns. TCF provides a clear system for mastering Tai Chi basics and a gateway to all traditional Tai Chi. Developed for people with pain and physical limitation, it includes three elements:

1. **Mind/Body Skills** foster attention, focus, breath and body awareness, and relaxation while moving.

2. **Standardized Movement Patterns/Basic Moves** teach postural alignment and movement skills for function and for performing Tai Chi form properly. Taught in a systematic developmental progression with consistent, discrete measurable increments in difficulty to foster success and optimize learning.

3. **TCF Form** is a simplified Yang Style Tai Chi taught in conjunction with the Basic Moves sequence.

**Applications** geriatrics, balance, wellness, mental health, (PTSD, TBI, polytrauma), management of chronic health conditions within all APTA preferred practice patterns. **Settings:** hospitals, VA facilities, rehabilitation, acute care, clinical settings, and staff wellness. **Classes:** community based, assisted living, home health, long-term care. Adapted for use with wheelchairs and walkers.

**Fidelity:** Multilevel certification options and recertification requirements since 2001. Certified instructors include Tai Chi, fitness instructors, PTs, OTs, nurses, activity and recreation professionals.

**AV Instructional materials:** include DVDs. Books and CDs for home practice and professional use. Visual Health Information (VHI) patient handout TCF software database.

**Professional CEU Courses since 2001:** in collaboration with PTs and OTs analyzing program applications, developing instructional materials, presentation tools and training curricula.

**CEUs Granted by:** 10 state PT Associations, APTA, AOTA, NCAOM.

**Tricia Yu, M.A.** creator, *Tai Chi Fundamentals® Program*, 1996, co-creator, *ROM Dance® Program* 1981. A pioneer in integrating Tai Chi into medical model exercise, she collaborated with health care professionals in developing training materials, seminars and certification for both programs. Director, Tai Chi Center, Madison WI 1974-2005, owner: *Tai Chi Health*, training and certifying professionals nationally. Certified Yang Style lineage Tai Chi instructor, She has coauthored articles for peer-reviewed journals and popular publications, presented at state and national PT, OT, ACSM and US Military Public Health conferences. She served as an expert panel member for an Intervention Protocol Development investigating Tai Chi for Patients with COPD, Osher Research Center Harvard Medical School, 2011.

**DISCLOSURE STATEMENT:** While a long-standing proponent of Tricia Yu’s *Tai Chi Fundamentals® Program*, the speaker does not have any financial interest in the product, service or material discussed in this presentation. The speaker is not an employee and/or stockholder in the business known as *Tai Chi Health*.
B. MIND-BODY PRINCIPLES (3)

1. ACTIVE RELAXATION
   a. Centering
      1) Attention to the present moment
      2) Breath awareness
      3) Relaxation
      4) Body upright and naturally aligned
      5) Awareness of hands and feet
   b. Relaxed Alertness: Be quiet ... Be alert
   c. Stillness with Movement: Be still as a mountain...Move like a great river

2. EFFECTIVE ACTION
   a. Body Mechanics: The motion is rooted in the feet, powered by the legs, directed by the torso and expressed in the hands
   b. Spontaneous action: Aligned and firm, be spontaneous, circular
   c. Moving around obstacles: Seek stillness, move with the flow
   d. Integrated Core Movement
   e. Proximal stability for distal mobility (PNF)

3. TAI CHI ENERGETICS (Chinese meridians)
   a. Heavies: tailbone, knees, elbow
   b. Lights: Crown of the head, eyes fingers (hands)
   c. Flexible and Rooted: Moving like a string of pearls

C. MOVEMENT PATTERNS

GUIDELINES FOR TAI CHI PRACTICE
1. Mindfulness
2. Breath Awareness
3. Postural alignment
4. Active Relaxation
5. Slow Movement
6. Weight Separation
7. Integrated Movement
TAI CHI AND PAIN REFERENCES

Pain Reviews

MSK Pain Management
PubMed “tai chi and osteoarthritis” – TOTAL = 95 articles, 36 reviews, 68 systematic reviews with 45 articles, 20 reviews, 14 systematic reviews in the last 5 years. A select few cited below.

FIBROMYALGIA SYNDROME