Tai Chi in Rehabilitation

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Objectives

• Review the Evidence for Tai Chi
• Describe the Principles of Tai Chi Practice
• Apply these Principles to the Management of Patients with Orthopedic Conditions

What is Tai Chi?

• Tai Chi Chuan=Taijiquan
• Taiji=“Supreme Ultimate”
• Quan=“Fist”
• Chinese Martial Art dating to the early Qing Dynasty (1644-1911)

What is Tai Chi?

• Practice focuses on developing the interaction between the mind and the body.

• Based on the Concept of Yin/Yang and Qi development within Chinese Medicine

Chinese Medicine

• Health=Balance
• Disease=Imbalance
• All systems are connected
• Focus on Maintenance of Health and Disease Prevention

Qi

• Life
• Air
• Energy
• Motion
• Power
Chinese Medicine

“Treating one who is already sick is like digging a well when already thirsty”

“Running water is never stale, and a door hinge never gets worm-eaten, for they keep moving”

Exercise is Medicine!!!

5 branches of Chinese Medicine:
• Acupuncture
• Herbal Therapy
• Dietary Therapy
• Manual Therapy (Tuina, Zhengdu, Gua Sha)
• Exercise Therapy (Qigong, Taiji)

Tai Chi is Evidence-Based Medicine

• Effects of Tai Chi are well studied
• Most frequently studied population is people over the age of 60

Balance/Fall Reduction

• Decreased # of Falls
• Fewer Injurious Falls
• Decreased Fear of Falling
• Improved Balance

“Treating one who is already sick is like digging a well when already thirsty”

• Balance
• Fall Reduction
• Proprioception
• Strength
• Bone Density
• Cardiovascular Benefits
• Immune Function
• Psychological Well-Being
Proprioception
- Decreased body sway
- Greater accuracy in positioning the body in space
- More accurate stepping

Strength
- Better Leg and Trunk Strength than Age-Matched Controls
- Improved Trunk and Leg Strength in OA
- Improved Hand Grip
- Improved Reaction Times

Bone Density
- Women who practice Tai Chi demonstrate 10-15% greater Bone density than age matched-controls
- 2.6-3.6 fold retardation in bone loss in postmenopausal women over 1 year

Cardio-Vascular Effects
- Reduced Blood Pressure
- Improved Oxygen Capacity
- Increased Heart Rate Variability
- Improved Peak Work on Graded Exercise test
- Improved Quality of Life, Decreased Depression for those in Cardiac Rehab

Tai Chi and Diabetes
- Improved Fasting Glucose
- Improved Insulin Receptor Binding Capacity
- Decreased Hemaglobin A1C
- Improved Nerve Conduction Velocities
- Improved Plantar Sensation

What about Back, Hip, Knee, (whole body) pain?
Pain Reduction

- Decreased pain and improved mood for Chronic Low Back Pain
- Decreased pain, improved self-efficacy and improved General Health for Osteoarthritis, Fibromyalgia, RA

Physical Activity for Osteoarthritis Management: A Randomized Controlled Clinical Trial Evaluating Hydrotherapy or Tai Chi Classes

- 12 wks of Hydrotherapy, Tai Chi, or Waitlist Control
- N=152
- Tai Chi= P Lam’s TC for Arthritis (24 Sun style form)
- Outcomes at 12 and 24 wks
  - Both treatment groups improved in:
    - WOMAC Pain and physical function
    - SF-12 physical component scores
    - Maintained at 24 wk follow-up
- Participation >12 sessions: Hydro=81%, TC=61%

Tai Chi is Effective in Treating Knee Osteoarthritis: A Randomized Controlled Trial

- 12 wks Tai Chi vs Wellness Education + Stretching
- N=40: outcomes at 12, 24, 48 wk follow up
- Tai Chi= 10 Modified Yang Style 2x/wk
- TC improved in WOMAC Pain and Function at 12 wks
  - Pain improvements continued at 24 wk, not 48 wks
  - Function not significant at 24, 48 wks
- TC improved Self Efficacy and Depression scores

A Randomized Trial of Tai Chi for Fibromyalgia

- Tai Chi vs Wellness Education + Stretching
- N=66, 12 and 24 wk follow-up
- Tai Chi= 10 Modified Yang Style 2x/wk
- FIQ: TC= -28.6 (-34.8 to -22.4) vs ED= -10.2 (-16.4 to -4.0)
- PSQI: TC= -4.2 (-5.8 to -2.7) vs ED= -1.2 (-2.7 to 0.4)
- Attendance: TC=77% vs ED=70%
A randomized controlled trial of 8-form Tai chi improves symptoms and functional mobility in fibromyalgia patients

James W. Carson, Robert M. Bennett, Fubong Li DOI 10.1007/s00491-012-2324-4

- Tai Chi vs Education (FM facts, Diet, CBT)
- N=101
- Tai Chi= 8 Modified Yang Style x 12 wks
- FIQ: TC= -16.5 vs ED= -3.1
- NPRS: TC= -1.6 vs ED= -0.5
- BPI: TC= -1.2 vs ED= -0.4
- Also: TC improved Sleep, Self Efficacy, TUG, Static and dynamic balance measures

Tai Chi Exercise for Treatment of Pain and Disability in People With Persistent Low Back Pain: A Randomized Controlled Trial

Amanda M. Hall, Chris G. Maher, Paul Lau, Manuela Ferreira, and Jane Latimer

- Tai Chi vs “Unusual Healthcare”
- N=160 with “nonspecific low back pain”
- 10 wks, 18 sessions of Tai Chi
- Measured following treatment (10 wks):
  - Reduced Back Pain
  - Reduced Bothersomeness
  - Reduced Disability
  - 57.5% of participants attended 50% of sessions
How does Taiji do all that?

- Precise Movement
- Breath
- Mindfulness
- Practice, Practice, Practice....

Taiji Posture

- Center the weight on the Feet
- Lengthen the Spine
- Sink the shoulders and elbows
- Tongue touches roof of mouth
- Regulate the Breath

Taiji Movement

- “When one part moves, all parts move”
- “Rooted in the feet, directed by the waist, expressed in the hands”
- “Open the Kua, turn the waist”

Prescribing Taiji exercise

- Training Volume
  - “Frame”
  - “Basin”
  - Speed
  - Duration
- Form vs Single Movement Practice

Prescribing Taiji exercise

- Taiji Philosophy
- Breathing
- Imagery
- Meditation
- Self Massage
- Push Hands
Case 1: Bilateral Knee Pain

- 51 yo Woman with L>R chronic knee pain: worse over last 4-6 months.
- Exacerbation of R knee pain after twisting knee to get out of car.
- MRI: R medial meniscus tear, chronic partial PCL tear
- L knee ACL reconstruction 20 yrs ago
- Treated acutely with a cortisone injection by Ortho.
- Now at a plateau despite ice, Ibuprofen PRN, and riding stationary bike (as recommended by Ortho)
- Aggs: pivoting, kneeling, prolonged standing or sitting, walking up/down hills or stairs.

Case 1: Bilateral Knee Pain

- NPRS = 0-2-8
- PSFS:
  - Pivoting=0/10
  - Walking Up/Down Hills=2/10
  - Tolerate standing for <=10
- Work=LMT
- Goal:
  - 3-4 sessions/day
  - each session 1+1.5 hrs
  - 5 days/week
- Antalgic gait
- Excessive Pelvic Drop L>R
- R knee painful endrange Flex-Ext
- L knee painful flex-extension
- R knee + Post Drawer
- L knee hypomobile Patella
- Weak core, hips, HS>quads
- Poor control of valgus/varus moments during pivoting, functional lunge
- Limited R hip ext/IR

Case 1: Bilateral Knee Pain

Treatment Goals:
- Improve Core/Hip/Leg strength
- Improve Neuromuscular Control
- Increase ROM of Hip and Knee
- Decrease Pain

Interventions:
- TC Opening Movement
- TC Single Leg Post
- TC Rolling the Ball
- TC Walking
  - Brush Knee
  - Cloud Hands
- Manual Therapy

Opening Movement

Single Leg Post with Rotation

Brush Knee
### Case 1: Bilateral Knee Pain: Outcomes

- 6 visits over 8 weeks
- NPRS = 0-1-2
- PSFS:
  - Pivoting=9/10
  - Walking Up/Down Hills=10/10
  - Tolerate standing for work=10/10
- Returned to full-time LMT practice

### Case 2: Chronic Recurrent LBP

- 66 y/o Woman w 20 yr Hx of Recurrent LBP, NP, Fibromyalgia
- Exacerbation 5 months prior: incr LBP, L>R leg Pain, Neck Pain
- Aggs: Bending, Lifting, Raking Leaves, Sitting at Computer>10min, Walking>30min, Stress
- Eases: Rest, Change Positions, Heat, Massage, Lumbar Support
- Previous RX: DC x 3 months, LAc x 12 session

### Case 2: Chronic Recurrent LBP

- NPRS=0-4-6
- PSFS:
  - Walking>30 min=3/10
  - Housework x 30min=3/10
  - Tolerate exercise class=3/10
- +++ Fear Avoidance
- Poor Self Efficacy

### Treatment Goals

- Improve Core/Hip/Leg Strength
- Improve Neuromuscular Control
- Decrease Fear
- Improve Self Efficacy
- Manage Stress
- Decrease Pain

### Interventions

- TC Standing/Seated Post
- TC Opening Movement
- TC Grasp Sparrows Tail
- TC Walking
- TC Old Man Carries Fish
- Pain Education via TC
- Self Massage
- Manual therapy
Case 2: Chronic Recurrent LBP:
Outcomes
- 6 Visits over 9 wks
- Decreased Fear of Activity
- Improved Self Efficacy
- NPRS: 0-2.4
- PSFS:
  - Walking: 30 min = 9/10
  - Housework: x 30 min = 6/10
  - Tolerate exercise class = 7/10

Questions?

Bibliography: Fall Prevention

Bibliography: Back Pain

Bibliography: Arthritis: Rheumatic disease
Bibliography: General