Task-Specific Movement Training: A Novel Treatment Approach for Chronic LE Pain

Speakers Gretchen B. Salsich, PT, PhD[1]; Barbara Yemm, PT, DPT, OCS[1]; Marcie Harris-Hayes, PT, DPT, MSCI[2]
Program in Physical Therapy, Saint Louis University[1]
Program in Physical Therapy, Washington University School of Medicine in St. Louis[2]

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Learning Objectives:
Upon the completion of this course attendees will be able to:
1. Identify features of altered lower extremity movement associated with patellofemoral pain and chronic hip joint pain.
2. Describe the motor learning principles underpinning a task-specific movement training intervention.
3. Design and implement a task-specific movement training intervention for patients with chronic knee and hip pain conditions.
4. Discuss the preliminary effects of a task-specific movement training intervention on health-related outcomes in patients with chronic knee and hip pain conditions.

Outline of Content:
I. Introduction – Gretchen Salsich
   A. Theoretical framework: movement-based mechanism of pain for patellofemoral pain (PFP) and chronic hip joint pain (CHJP)
      1. Kinesiopathologic model *(Sahrmann, 2002)*
      2. LE-specific model – "Dynamic Valgus" *(Powers, 2003)*
      3. Supporting evidence: PFP and CHJP
         a) Alignment of femur and/or tibia is associated with altered joint mechanics *(Lee et al., 1994 and 2003; Salsich et al., 2007)*
         b) Altered kinematics in people with PFP and CHJP *(Willson et al., 2008; Souza et al., 2009; Salsich et al., 2010; Noehren et al., 2011; Nakagawa et al., 2012; de Oliveira Silva et al., 2016; Neal et al., 2016*; *Austin et al 2008; Kumar et al 2014; Diamond et al 2017; Bagwell 2016)*
         c) Associations between kinematics and pain/function in people with PFP and CHJP (*Salsich et al., 2012 and 2015; Nakagawa et al., 2013; Ferrari et al., 2017; Harris-Hayes et al., 2017; Austin et al 2008; Kumar et al 2014)*
   B. Trends in current practice for PFP and CHJP
      1. Hip muscle strengthening, stretching or multimodal interventions *(Crossley et al., 2016; Emara et al 2011; Yazbek 2011; Hinman 2015)*
         a) Is the rationale supported?
            i. Relationship between musculoskeletal impairments and movement?

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ii. Is hip weakness a predictor of pain development? *(Rathleff et al., 2014)*

b) Limited evidence of effect of impairment-directed treatment on movement *(Baldon et al., 2014)*

c) Home program? Patient education?

d) Questionable adherence and long-term outcomes

2. Exponential growth in surgery for CHJP

C. A Paradigm Shift – Target movement directly (Task-specific Movement Training)

1. Better aligned with Kinesiopathologic model

2. Foundations in Motor Control and Learning
(Hubbard et al., 2009; Kleim and Jones 2008)
a) Task salience, high repetition practice, task progression, intrinsic feedback

II. Description of Intervention for PFP *(Salsich, et al., 2017)* – Barb Yemm

A. Modeled after previous investigators who studied other populations

1. Catherine Lang (stroke) - *(Birkenmeier et al., 2010)*

2. Linda Van Dillen (low back pain) -- *(ClinicalTrials.gov #NCT02027623)*

3. Marcie Harris-Hayes (chronic hip joint pain) - *(Harris-Hayes et al., 2016; ClinicalTrials.gov* #NCT02913222*)*

B. Patient population

1. Inclusion criteria

2. Demographics

C. Implementation of intervention

1. Design – 2x/wk for 6 wks; 45 min sessions

2. Pt education/instructions (rationale & key concepts of optimal movement)

3. Task selection and practice (high repetitions)

4. Assessment of pain and movement quality

5. Feedback

6. Task progression

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D. Home program
    1. Practice moving optimally during all daily activities
    2. No additional “exercises”

E. Assessment of adherence *(Harris-Hayes et al., 2010)*

III. Preliminary Efficacy of Intervention for PFP – Gretchen Salsich
A. Effect on outcomes
    1. Movement
    2. Pain
    3. Function

B. Participant Retention and adherence to home program

IV. Summary and future directions – PFP

V. Description of Intervention for CHJP *(Harris-Hayes et al., 2016)* -- Marcie Harris-Hayes
A. Patient population
    1. Inclusion criteria
    2. Demographics

B. Implementation of intervention
    1. Design
    2. Pt education/instructions (rationale & key concepts of optimal movement)
    3. Task selection and practice
    4. Assessment of pain and movement quality
    5. Feedback
    6. Task Progression

C. Home program

D. Assessment of adherence

VI. Preliminary Efficacy of Intervention for CHJP – Marcie Harris-Hayes
A. Effect on outcomes
    1. Movement
    2. Pain

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3. Function

B. Participant retention and adherence to home program

VII. Summary and future directions – CHJP

VIII. Panel Discussion & Questions

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