Knee Pain/Osteoarthritis: Occupational Therapy Approaches

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Objective

• Emerging directions in OA research and how OT can uniquely contribute to OA clinical management
How is Knee OA Treated?

“Treatment Gap”
- Tried and exhausted conservative OA management, but still have debilitating pain
- ‘waiting’ for joint replacement

Typically no OT referral unless for assistive devices, compensatory strategies

Management Recommendations

EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis

Osteoarthritis and Cartilage

OARSI guidelines for the non-surgical management of knee osteoarthritis

A systematic review of recommendations and guidelines for the management of osteoarthritis: The Chronic Osteoarthritis Management Initiative of the U.S. Bone and Joint Initiative

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Adam P. Goods, DPT, PhD,^1,4 Joanne M. Jordan, MD, MPH^2,3,4
Management Recommendations

Treatment Provided

(Dieppe et al., 2005; Hunter, 2011)

joint replacement

Injections

NSAIDS, Other Drugs, Rehab

Analgesics, topical agents

Education, weight loss, lifestyle interventions

Management recommendations

Numbers of people

Limitations of Management Guidelines for OT

- Lack of evidence in OT translates to lack of recommendations
- OTs not always on review teams determining recommendations
- Primary outcomes of interest in OA guidelines are pain and physical function. OT outcomes are broader
New Horizons for OA Treatment—Beyond the Biomedical Approach

• Tailored treatments
  – Pain subgroups
  – Pain experience
  – Other characteristics
• Development of evidence-based OT interventions
  – Integration of self-management into clinical care
  – Other important outcomes to clients in addition to pain

Biomedical Tx Approach

• joint pain is due to joint damage
• relief of joint pain leads to improved physical function / quality of life

Fix the disease, you will fix the problem
OA ‘Disease’ May Not Be the Problem

- Knee pain severity and knee joint pathology not consistently related
- Other factors may also impact physical function and quality of life in OA (biopsychosocial tx approach)
  - Lack of physical activity
  - Widespread pain
  - Fatigue
  - Depression
  - Psychosocial factors
- The above factors may provide important information on which to tailor treatments

Tailoring OT Treatment

- Emerging research on understanding pain mechanisms and how pain is felt in daily life
- Pain mechanisms
  - ‘Centralized’ pain versus joint pain
- Pain experience
  - Persistent pain, fluctuating, activity-related
Normal Pain Mechanism

Sensory neurons detect low threshold or high threshold inputs.

CNS pathways are activated.

Conscious awareness of pain sensation.

Murphy et al., 2012 Curr Rheumatol Reports, 14, 576-582; Woolf 2011, Pain, 152, s2-15

OA – Peripheral Sensitization

Increased responsiveness of neurons due to repeated stimulation (more firing, bigger pain receptor fields).

Can lead to amplification of pain responses around joint site and beyond.
OA – Central Augmentation

Tenderness and referred pain away from knee joint

CNS pathways altered leading to hyperalgesia (increased pain perception, allodynia)

Other ‘centrally-mediated’ symptoms: widespread pain, fatigue, sleep disturbance, depression

Why does this Matter for OA Treatment?

- Different types of symptom experiences in people with OA
- Rehabilitation treatments largely focus on joint pain
  - Exercise
  - Orthotics
  - Patellar taping
  - Assistive devices
  - Joint protection education
What about these People?

- Rehab studies have begun to focus on CNS sensitization
  - Manual Therapy
  - TENS
- Rehabilitation treatments should also be geared at symptom experience

OT can offer:
- Activity Pacing
- Behavioral self-management

Murphy et al., 2012 Curr Rheumatol Rep, 14, 576-582

OA Pain Felt in Daily Life

- Symptoms are activity-related in earlier OA stages, and more persistent in later stages (Hawker et al. 2008)
- MOST study--40% of people with and without knee OA had fluctuating knee pain
  - these people had less radiographic OA disease, fewer depressive symptoms, and less widespread pain (Neogi et al., 2010)
- LEAP study showed pain fluctuation was associated with fluctuation in psychological factors (Wise et al., 2010)

Implications for Tailoring OT Treatment

• Understanding more about individual/subgroups with OA can help better target treatment
  – Better assessment needed
  – Moderators tested in clinical trials
  – Individuals with centralized pain, more symptom burden may need approach beyond joint-focus

OT Interventions in Self-Management

• Activity Pacing (Murphy et al., BMC Musculoskeletal Disorders, 2011, 12, 177)

• Behavioral self-management program (Murphy pilot project)
  – Both projects based on preliminary work that showed fatigue was an important outcome
Activity Pacing

- Used to address symptoms that interfere with activity engagement to help alter **inefficient activity patterns**

  - **Problems**
    - not tested as a stand-alone treatment
    - Poorly defined leading to variable implementation by clinicians

  - **Over-activity**
    - with symptom spikes, prolonged rest periods

  - **Under-activity**
    - No symptom spikes, but not enough activity

- **Impaired physical capabilities/disability**

Pacing Defined

- Activity pacing is a behavioral strategy in which people learn to lessen the effect of symptoms on activity by breaking up activities into smaller pieces, and alternating activity and rest periods to maintain a steady pace (Fordyce, 1976)
  - Time-based pacing
  - Task-based pacing
  - Energy Conservation
Objectives of this Study

- To develop and test a brief OT-delivered intervention to teach activity pacing that could eventually be used in clinical practice
- To test the optimal method of teaching activity pacing based on knowledge of people’s ‘symptom-activity’ relationships:
  - **General activity pacing** – people report on their usual activities, how symptoms are affected, problematic activities are examined
  - **Tailored activity pacing** – a more quantitative picture of activity and symptoms in a usual week is compiled using an enhanced accelerometer

Model and Aims

**Aim 1**: To examine the short and longer term effectiveness of a tailored activity pacing intervention on fatigue, pain, and physical function.

**Aim 2**: To determine if increased arthritis self-efficacy post intervention is related to improvements in symptom severity and function.

**Aim 3**: To evaluate the effect of tailored activity pacing on physical activity.
Tailored vs. General Intervention

<table>
<thead>
<tr>
<th>Tailored report</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>symptom/activity relationship</td>
<td>Wk 1: Lab visit 1 (testing/home monitoring)</td>
</tr>
<tr>
<td></td>
<td>Wk 2: OT visit 1</td>
</tr>
<tr>
<td></td>
<td>Wk 3: OT visit 2</td>
</tr>
<tr>
<td></td>
<td>Wk 4: Lab visit 2 (testing/home monitoring)</td>
</tr>
<tr>
<td></td>
<td>Wk 10: Lab visit 3 (testing/home monitoring)</td>
</tr>
</tbody>
</table>

Pacing Principles Taught

<table>
<thead>
<tr>
<th>Awareness</th>
<th>Symptoms and how they are related to their activities/routines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-planning</td>
<td>Within and across days</td>
</tr>
<tr>
<td>Prioritizing</td>
<td>Necessary and valued activities</td>
</tr>
<tr>
<td>Scheduling</td>
<td>Breaks from activity periods may require rest or activity</td>
</tr>
</tbody>
</table>
**Behavioral Self-Management**  
*(the ENGAGE study)*

- OT-guided self-management program for people with OA
- Program is delivered on a DVD  
  – adapted from a successful program designed for people with fibromyalgia
- OT’s role is to tailor content *(problem solve, overcome barriers)* to help people learn and integrate skills for symptom management
- Combines CBT principles and what OTs do best
Aims and Procedure

• Evaluate the efficacy of the ENGAGE intervention versus usual care in improving physical function and other outcomes (pain, fatigue, physical activity) in adults with knee OA

• $N = 30$ (2:1 ratio)
OT-Tailoring

- Brief review of topic, if necessary
- Assess self-monitoring/homework
- Guide subject through goal setting & problem solving barriers
- Assign homework

Self-Monitoring is Key

<table>
<thead>
<tr>
<th>Physical Activity Spectrum Worksheet (Example)</th>
<th>Date: October 21, 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>Step 2</strong></td>
</tr>
<tr>
<td><strong>Physical Activity Spectrum</strong></td>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Time Slot</strong></td>
<td><strong>Activities, Chores, Errands, Work, Child care, Leisure</strong></td>
</tr>
<tr>
<td>6-8am</td>
<td>Shower; Get kid ready for school</td>
</tr>
<tr>
<td>8-10am</td>
<td>Commute; Sit at desk</td>
</tr>
<tr>
<td>10-moon</td>
<td>Delivered paycheck at work; Went out to lunch - walked; Get at desk</td>
</tr>
<tr>
<td>Noon-2pm</td>
<td>Sit at desk</td>
</tr>
<tr>
<td>2-4pm</td>
<td>Sit at desk; Walk to neighboring office</td>
</tr>
<tr>
<td>4-6pm</td>
<td>Sit at desk</td>
</tr>
<tr>
<td>6-8pm</td>
<td>Yoga tape; Prepare dinner</td>
</tr>
<tr>
<td>8-10pm</td>
<td>Watch TV; Get ready for bed</td>
</tr>
<tr>
<td>10-12mid</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>660 min</td>
</tr>
</tbody>
</table>

Step 4: Notes about this day to self. Pretty good – I did a combination of lifestyle and structured physical activities. I also included some activities that were from the "moderate" portion of the physical activity spectrum. I think I might like to try to add some more lifestyle activity during the work day - maybe get up and move every hour or so.
Summary

• OT currently has a limited role in Knee OA management
• Development of evidence-based OT treatments necessary
  – Tailoring treatments will be informed by advances in assessment
• Self-management in clinical care is one important area where OT can contribute