A Joint Effort: Managing Hip and Knee Osteoarthritis

Course Objectives:

- Participants will be able to educate patients about osteoarthritis including the objectives of treatment, importance of lifestyle change, value of exercise, pacing of activities, weight reduction and other strategies to unload joints.
- Participants will understand clinical diagnosis of osteoarthritis and degenerative meniscus tears, utility of radiographs and MRIs, and limited utility of arthroscopy.
- Participants will be able to prescribe individualized, patient specific exercise and self-management programs in accordance with OARSI guidelines and using the ICF model.
- Participants will have exposure to supplementary PT interventions and associated utility of these interventions.
- Participants will become proficient in measuring functional outcomes and physical testing for patients with hip and knee OA.
- Participants will understand risk reduction for total joint replacement, emerging surgical criteria, and shared decision-making strategies.
- Participants will be able to use the PT quality indicators for osteoarthritis to evaluate clinical practice.
- Participants will learn basic strategies to nudge patients along the health behavior change continuum.
OA: Disease of the Whole Joint

- Articular cartilage
- Meniscus pathology
- Subchondral bone
- Ligaments
- Capsule
- Synovial membrane
- Periarticular muscles

NOT JUST A DISEASE OF CARTILAGE!!

<table>
<thead>
<tr>
<th>Age ≥50 years</th>
<th>EULAR</th>
<th>ACR</th>
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<tbody>
<tr>
<td>Symptoms</td>
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<tr>
<td>Knee pain</td>
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<td>No EMS, or EMS ≤30 mins</td>
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<tr>
<td>Functional limitation</td>
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<td>Clinical signs</td>
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<tr>
<td>Crepitus</td>
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<td>Restricted range of motion</td>
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<tr>
<td>Bone enlargement</td>
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<tr>
<td>Bone margin tenderness</td>
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<tr>
<td>No palpable warmth</td>
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EULAR criteria: Necessary feature
ACR criteria: Necessary feature
Plus any 3 or more of these features
6 core strategies for providers

- Assessment of pain, function and QOL
- Education + self-management
- Physical activity and exercise counseling and management
  - Effect Size of 0.4-0.5 for knee and hip OA
- Nutritional assessment and counseling on weight loss
  - Effect size 0.37 (Evidence of knee OA only) – Dose dependent
- Medication counseling and management
- Psychological health evaluation of coping and mood assessment

6 core strategies for patients

People who successfully manage osteoarthritis do these 6 things:

- Understand the disease
- Healthy body weight
- Physical activity
- Avoid injury
- Have good coping strategies and positive attitude.
- Have a pain management plan
WHAT SHOULD YOU KNOW ABOUT KNEE OSTEOARTHRITIS?

**MYTHS**
- Degree of arthritis on a scan predicts your pain and disability levels
- Rest is helpful
- Only surgery will fix it
- Exercise is dangerous
- Pain = damage

**FACTS**
- Scans are poorly related to pain and disability
- Rest and avoidance makes pain worse
- Graded exercise is safe and helps
- 20% of people do not get any pain relief from knee joint replacement
- Pain ≠ damage

**FACTORS RELATED TO KNEE HEALTH**
- Osteoarthritis + Bone edema
- Stress/Isolation Depression Fatigue Anxiety
- Muscle weakness Protective guarding
- Unaccustomed load: Recreation Occupation Sport
- Genetics Injury
- Obesity
- Lifestyle: Lack of sleep Lack of physical activity

**WHAT IS LOW VALUE CARE** (passive treatments)
- Massage
- Needles
- Rollers
- Tens
- Ultrasound
- Laser
- Interferential
- Opioids
- Imaging
- Arthroscopy
- Injections
- Relying on common supplements
- Knee replacement for inappropriate candidates
- Low dose poorly targeted exercise

**WHAT IS HIGH VALUE CARE** (active treatments)
- Evidence based education
- Exercise (movement control, fitness, weight-bearing/strength)
- Referral when indicated
- Lifestyle change: physical activity, weight loss

*Knee replacement for appropriate candidates, after high value nonsurgical approaches have been trialled*
Cardiovascular Exercise

“Start low, go slow.”
- It can take patients 6-8 weeks to adjust to a new exercise routine, causing more symptoms than usual.
- Begin with “joint friendly” exercise:
  - Aquatic, cycling, walking programs.

“Ramp it up”
- Moderate intensity cardio is best
  - 12-14 RPE/“can talk but not sing”

Be their cheerleaders, they will need the encouragement.

Expect some new symptoms with new exercise – teach your patients to identify a “safe increase” in symptoms and teach the 24-hour rule.

Intensity:

<table>
<thead>
<tr>
<th>Borg's Rating of Perceived Exertion (RPE) Scale</th>
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<tbody>
<tr>
<td>Perceived Exertion Rating</td>
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<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>6</td>
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https://aces.nmsuedu/pubs/1112/welcome.html
Test yourself... Are you using enough resistance to build muscle?

- Select an exercise and a method of resistance.
- Count how many repetitions you can perform before fatigue.

<table>
<thead>
<tr>
<th>%</th>
<th>repetitions</th>
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<tbody>
<tr>
<td>100%</td>
<td>1</td>
</tr>
<tr>
<td>95%</td>
<td>2</td>
</tr>
<tr>
<td>90%</td>
<td>4</td>
</tr>
<tr>
<td>85%</td>
<td>7</td>
</tr>
<tr>
<td>80%</td>
<td>11</td>
</tr>
<tr>
<td>75%</td>
<td>16</td>
</tr>
<tr>
<td>70%</td>
<td>22</td>
</tr>
<tr>
<td>65%</td>
<td>25</td>
</tr>
<tr>
<td>60%</td>
<td>30</td>
</tr>
</tbody>
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Signs of fatigue:

- Unable to perform the complete movement pattern
- Must take a “mini rest break” before continuing
- Feel that you cannot possibly continue
- Major substitution patterns

Based on the grid above can you modify the exercise so that your resistance is between 60-80% of your maximum capacity?

Once you have found the correct resistance, then you can plan your exercise. For best results:

- Do 12 repetitions
- 2 sets
- 3 days/week
Supercompensation

Building Fitness:
- Hard work
  - Strength: 50-80% of 1RM
  - Cardio: 12-14 RPE
- Followed by Rest
  - 48 hours between strength training sessions
  - 24 hours between cardio sessions
  - 4 days between bouts of long endurance activities
- Consistently
  - Strength: 2-3x/week
  - Cardio: 4-7x/week
- For 6-10 weeks to build muscle.
PT Quality Indicators:

Are physiotherapists adhering to quality indicators for the management of knee osteoarthritis? An observational study
David Spitaels a, *, Rosella Hermens a, b, Dieter Van Assche c, d, Sabine Verschueren d,
Frank Luyten c, Patrik Vankrunkelsven a

1. Education checklist
   □ information access and education about the objectives of treatment
   □ importance of changes in lifestyle
   □ exercise, pacing of activities
   □ weight reduction and other measures to unload the damaged joints
     ○ use of devices (cane, stick, ...)
     ○ weight loss
     ○ exercises/moving
     ○ foot wear and bracing

2. If a patient with knee OA is overweight, then he should be encouraged to lose weight and maintain weight at a lower level
   □ Self-monitoring
   □ Meet with a dietitian
   □ Motivational interviewing for lifestyle change with patient-inspired changes

3. If a patient has knee OA, then exercise therapy should be prescribed, including at least muscle strengthening, aerobic exercises and functional exercises
   □ Aerobic exercises
   □ Functional exercises
   □ Strength training
   □ If a patient has ROM restrictions, then prescribe range-of-motion exercises

4. If a patient with knee OA is following exercise therapy, then the content and intensity of the exercise program should be tailored to the patients' individual goals in terms of limitations of activity and restrictions of participation.
   □ Patient interest
   □ Access/convenience of the exercise
   □ Motivation: support / reward

5. If a patient with knee OA is following exercise therapy, then the exercise therapy should be combined with education/self-management interventions to improve patients' mental and physical performance to alleviate pain
   □ Understanding nerve sensitization:
     ○ 24-hour rule
     ○ Self-determined “Safe increase” in pain rating during exercise
     ○ Self-management strategies to reduce pain
     ○ What to do if pain does not subside:
       ▪ Rescue routine
       ▪ Lighter activity intensity for 2 days
         • Keep chondrocytes stimulated
         • Lubricin as body's natural anti-inflammatory
         • Schedule PT
       ▪ Medication strategies
   □ Planning for OA management in lifestyle:
- Travelling or sedentary works tasks – get up and move 10 minutes of every hour
- Step counter / activity tracker to judge trends in activity and symptoms

6. If a patient has symptomatic knee OA, then he has to be referred to a physical therapist for instruction of the patient in appropriate exercises, for motivation of the patient to implement exercise and adhere to exercise and to evaluate the performance.

- There is value in avoiding unsafe activities, however there is a fine line between teaching safe activity and making patients fearful of activity, worried they may “do it wrong.”

7. If a patient with knee OA is following exercise therapy, then the treatment sessions should be spread over longer periods with lower frequencies in the later stages of the exercise program to facilitate the transition from exercise therapy to independent exercising and maintaining sufficient level of physical activity.

- Set at least one very long-term goal for self-management “as evidenced by ability to ____”
- Medicare = 60 days without a renewed prescription/plan of care so schedule last visit in 6 weeks during formal course of PT.

8. If a patient with knee OA is following exercise therapy, then regular evaluations by the physiotherapist are necessary. To make the switch-over from a supervised to an autonomous program an evaluation session should be performed every three months in the first year, every six months in the second year and once a year afterwards.

- Epic: Consider sending a patient message to automatically send 3 months after discharge.
- US mail encouragement cards, reminding patients of their goals (they could even draft themselves at discharge).

9. If a patient with knee OA is following exercise therapy, then he should be referred to regular community and sports activities after a period of supervised exercise.

- Community resource list is needed for exercise activities, access to swimming pools, and list of personal trainers who have experience working with patients who have joint pain.
Key messages for patients:

Exercise, physical activity and weight loss
Regular physical activity and individualized exercise programs (including muscle strengthening, cardiovascular activity, and flexibility exercises) can reduce your pain, prevent worsening of your osteoarthritis, and improve your daily function†

If you are overweight and have osteoarthritis, it will be beneficial to lose weight and maintain a healthy weight through an individualized plan involving dietary changes and increased physical activity

Living a sedentary life could worsen your osteoarthritis and also increases your risk of other lifestyle-related diseases, such as diabetes and cardiovascular disease†

Individualized exercise is an integral component of treatment for everyone with osteoarthritis†

Maintaining sufficient muscle strength around the joints is important in reducing pain and maintaining function, and if you require an operation will benefit both pre- and post-operative periods of your treatment†

Linking your individualized exercises to your other daily activities is a useful way to become more active†

Individualized exercises only work for your osteoarthritis if you do them regularly†

Small amounts of individualized exercise undertaken frequently can be beneficial for your osteoarthritis

Very Important Truths About Exercise, Weight Loss, and Osteoarthritis:

- Exercise is the #1 strategy to managing joint pain with osteoarthritis.
- Major health benefits are gained through regular participation in physical activity.
- Weight loss / management can also help to reduce joint pain for people with osteoarthritis.
- The most effective strategies for losing weight include:
  - Self-monitoring
  - Meeting with a dietitian.
- Weight loss is primarily achieved through nutrition strategies = 80%.
- Only people who can exercise at a moderate-vigorous intensity for ≥ 1 hour, 5 days/week can use exercise to lose weight.
- Having more lean body mass through strength training, will improve the effectiveness of weight management but only to the effect of 20%.
Pain Sensitization

Peripheral sensitization:
- There are more nerve endings in a joint with OA than normal
- "Inflammatory soup" increases the sensitivity of nerve endings

Central sensitization:
- Changes occur in the brain and dorsal horn of the spinal cord
- Spatial extent is widespread
- Out of scale of the stimulus
- Lasts beyond the typical timeframe for healing a body tissue
- Tends to be summative

24-hour Rule

Abnormal pain often occurs with osteoarthritis and it can be difficult to interpret new symptoms after activity.

Using the basic 24-hour rule can help patients to determine if the new activity is helpful.

If symptoms resolve to baseline within 24-hours the new activity is HELPFUL even if it hurts.
Exercising with Osteoarthritis

Around 27 million Americans have osteoarthritis (OA), a degenerative joint disease. Ongoing loss of cartilage causes joint pain and reduced range of motion. This often leads to physical disability and reduced quality of life.

There are several risk factors for OA. They include old age (about 80 percent of adults over age 65 are affected), being female, and overweight and obesity. Previous injury, muscle weakness, and joint laxity are also risk factors. Weight-bearing joints, like knees and hips, are at greatest risk. We cannot change some risk factors, like age or gender. But we can change other factors to reduce the risk of OA.

Exercise with OA can be difficult and painful, which leads to less activity. This then causes joints to become stiffer and less flexible. Surrounding muscles become weaker. This leads to even less activity. Exercise can help. It decreases joint swelling and pain. It helps you maintain a healthy weight. As a result, this reduces pressure on your joints and improves cartilage and bone tissue health. Exercise improves overall function. The key is to stay active and choose activities you enjoy.

Evidence suggests both aerobic and strength exercise helps people with OA. So try to do both. If you are just starting out, do more aerobic exercise. This will also help you lose weight. Over time, add resistance workouts. Doing both types will bring even more benefits for your pain and joint stiffness. It will also help your overall health and fitness.

Getting Started

• Talk with your doctor before you start an exercise program. Ask about any changes to your medications or concerns in becoming more active.
• Take all medicines prescribed by your doctor.
• Select low-impact and non-impact activities. Walking, swimming, water exercise and cycling are good choices.
• A long warm-up and gradual cool down may help you avoid additional joint pain.
• Divide your activity into many short sessions during the day. Try three 10-minute sessions to start. Set goals by time rather than distance.
• Start slowly. Over time, add to the intensity and length of your workouts. Take frequent breaks as needed. Adjust your workouts based on your symptoms.
• Start by exercising on your own. Begin walking or another form of activity that you can add to your daily routine.
• Invite others to join you. Exercising together is more fun and increases the chance you will continue. Dogs make great walking partners!
• Look for programs in your community. You could also contact an appropriately credentialed exercise professional* to help you. All you really need, though, is a good pair of shoes to get started walking.
• Select shoes and insoles that absorb shock.
• Using a pedometer or other device to track your exercise. Slowly work toward a goal, like maybe 10,000 steps per day.

Aerobic Exercise Programs

The American College of Sports Medicine and the Centers for Disease Control and Prevention recommend at least 150 minutes per week of moderate-intensity aerobic activity, 75 minutes of vigorous aerobic activity, or an equivalent combination of both for adults. They also suggest muscle strengthening twice a week. Follow the FITT principle to design and implement a safe and effective program you will enjoy. F = frequency, I = intensity, T = time, and T = type. There are no established FITT guidelines for people with OA. Use the FITT guidelines for apparently healthy adults, but adjust for your own pain, stability, and functional limits.
Frequency – Be active on most days of the week but at least three to four days.

Intensity – Exercise at a moderate level. Use the “talk test” to help you monitor. For example, even though you may notice a slight rise in your heart rate and breathing, you should be able to carry on a conversation while walking at a moderate pace. As you walk faster, you will begin to breathe faster and have difficulty talking. At that point, you’ve achieved moderate intensity or “somewhat hard.” Vigorous exercise causes a large rise in heart rate and breathing. At this intensity it would become difficult to talk. Most people would rate this as “hard to very hard.”

Time – Exercise 30 to 60 minutes per day. You can do it all at once or break it up into a few sessions of at least 10 minutes each. Multiple, shorter sessions may help reduce joint pain.

Type – Exercise in the water to reduce joint stress. It also improves cardiovascular fitness. Do activities you enjoy and will do regularly in your new, more active lifestyle. Add variety depending on the day or the season to keep your program more enjoyable.

Aerobic Exercise Cautions

If you have been inactive for a long time, start with shorter sessions (10 to 15 minutes). Add five minutes to each session, increasing every two to four weeks. Over time, build up to being active at least 30 minutes a day on most days of the week.

Expect some discomfort after your workouts. However, you should not be in pain. If pain is greater two hours after exercise than it was before, reduce the length and intensity of your next session.

Total exercise time is more important than intensity. If you exercise at too high an intensity, you may not be able to exercise very long. High-intensity exercise also increases your risk of injury.

Avoid vigorous, highly repetitive activities. This is especially true for people with unstable joints.

Avoid overuse and repetitive stress injuries by alternating types of exercise over consecutive days.

Drink plenty of fluids before, during, and after exercise.

Resistance Exercise Programs

Evidence suggests that light- to moderate-intensity resistance training is a good addition to your program. Muscle atrophy often accompanies OA. Resistance training helps reverse atrophy. It also strengthens the muscles surrounding the joint. This reduces the risk of injury and more joint damage. Resistance training helps in other ways, too. It increases or maintains the amount of muscle. It improves your ability to function. And it also promotes overall good health.

Frequency – At least two to three days per week. Plan a day of rest between sessions.

Intensity – Light to moderate. Light intensity is weight you can lift 15 to 20 times. Moderate intensity is weight you can lift 10 to 15 times.

Time – This depends on the number of exercises you do. In general, do one to three sets of 10 to 15 repetitions.

Type – Exercise all major muscle groups but concentrate more on muscles surrounding the affected joints first. This will help strengthen and stabilize them. Exercise in the water with light resistance to reduce stress on the joints. Water exercise conditions muscles through a full, pain-free range of motion. Exercise with a machine or with free weights. There is little difference between them. Don’t belong to a gym or health club? No problem. You can do the same exercises at home with lighter weights, resistance bands, or your body as the resistance. Try push-ups or sit-ups.

Resistance Exercise Cautions

Avoid holding your breath when lifting. This can cause large changes in blood pressure. That change may increase the risk of passing out or developing abnormal heart rhythms. This is especially true if you also have high blood pressure.

Start with 10 to 15 repetitions. Build up to 15 to 20 repetitions before you add another set.

Other Types of Exercise

Stiffness and pain cause joints to be less flexible. Thus, exercise often is avoided. Maintain flexibility by using the joint. Also, do activities that stretch the muscles across the joint. Otherwise, unused muscles will shorten and limit range of motion.

Do flexibility exercises every day.

Do dynamic flexibility exercises for all major muscle groups. This increases their range of motion.

Avoid overstretching.

Yoga, Pilates and tai-chi help improve strength and flexibility. They also help you relax and reduce pain.

Design your exercise program for the most benefit and the fewest risks to your health or physical condition. Contact an appropriately credential exercise professional* to work with you and your doctor. They can help you establish realistic goals. And together, you can design a safe, effective, and enjoyable program to meet your needs and goals.

For more information, visit www.exerciseismanage.org or e-mail eim@acsm.org.

* A listing of exercise professionals can be found at www.usreps.org and EIM Credentialed professionals can be found through the ACSM ProFinder (http://bit.ly/1Mp6lDN).