This lecture was originally developed as part of Orthopedic Primary Care, a six-month continuing education program presented yearly by the Jackson Orthopaedic Foundation, a non-profit organization in Oakland, California.

More information at:

OrthoPrimaryCare.Info

www.jacksonortho.org
This presentation includes discussion of several commercial products and devices that are currently being evaluated for therapeutic value in the treatment of osteoarthritis.
Drs. Benham & Geier have no financial interests/arrangements or affiliations with one or more organizations that could be perceived to have real or apparent conflicts of interest in the context of the subject of this presentation.
At the conclusion of this presentation, participants will be able to:

1. Identify three evidence-based treatments for osteoarthritis that have strong consensus among experts.
2. Recommend individualized OA treatment plans based on patient presentation and co-morbidities.
3. Discuss the relative risks and benefits of OA treatments for which evidence is still unclear.
4. Discuss evidence for treating OA with: oral & topical NSAIDs & opioids; injected corticosteroids & hyaluronates, acetaminophen, duloxetine, avocado soy unsaponifiables, glucosamine/chondroitin, and diacerin.
• Most common type of arthritis
• Major cause of chronic musculoskeletal pain and disability in elderly populations worldwide
• Up to 40% of people over the age of 65 suffer symptoms associated with knee or hip osteoarthritis
• Major cause of difficulty in walking and climbing stairs in the elderly.
Osteoarthritis (OA)
Goals of OA Treatment

Treatment of OA of the knee and hip is directed towards:

- Reducing joint pain and stiffness.
- Maintaining and improving joint mobility.
- Reducing physical disability and handicap.
- Improving health-related quality of life.
- Limiting the progression of joint damage.
- Educating patients about the nature of the disorder and its management.
AAOS Guidelines

- Rehab, Education, Wellness
- Weight Loss
- Acupuncture
- Ice, Heat, Tens
- Manual Therapy
- Medial Unloader Brace
- Lateral Wedge Insoles
- Glucosamine/Chondroitin
- NSAIDs or Tramadol
- Acetaminophen, Opioids, and analgesic patches
- Intraarticular Corticosteroids
- Viscosupplementation
- Biologic Injections
- Needle Lavage
- Arthroscopy
- Partial Meniscectomy
- Tibial Osteotomy
- Unispace

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<table>
<thead>
<tr>
<th>Medication Type</th>
<th>Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Recommend</td>
<td>None</td>
</tr>
<tr>
<td>Conditionally Recommend</td>
<td>Acetaminophen, Oral NSAID, Topical NSAID, Tramadol, Intra-articular corticosteroids</td>
</tr>
<tr>
<td>Conditionally Not Recommend</td>
<td>Chondroitin sulfate, Glucosamine, Topical capsaicin</td>
</tr>
<tr>
<td>No Recommendation</td>
<td>Intra-articular hyaluronates, Duloxetine, Opioid analgesics</td>
</tr>
</tbody>
</table>

ACR, American College of Rheumatology; NSAID, non-steroidal anti-inflammatory drug
<table>
<thead>
<tr>
<th>Strongly Recommend</th>
<th>Conditionally Recommend</th>
<th>Conditionally Not Recommend</th>
<th>No Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular and/or resistance land-based exercise</td>
<td>Self-management programs</td>
<td>None</td>
<td>Balance exercises</td>
</tr>
<tr>
<td>Aquatic exercise</td>
<td>Manual therapy with supervised exercise</td>
<td></td>
<td>Laterally wedged insoles</td>
</tr>
<tr>
<td>Weight loss (if overweight)</td>
<td>Psychosocial interventions</td>
<td></td>
<td>Manual therapy alone</td>
</tr>
<tr>
<td></td>
<td>Medially directed patellar taping</td>
<td></td>
<td>Knee braces</td>
</tr>
<tr>
<td></td>
<td>Wedged insoles (medial for lateral osteoarthritis, lateral for medial osteoarthritis)</td>
<td></td>
<td>Laterally directed patellar taping</td>
</tr>
<tr>
<td></td>
<td>Thermal agent instruction</td>
<td></td>
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<tr>
<td></td>
<td>Walking aides as needed</td>
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<tr>
<td></td>
<td>Tai chi</td>
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<tr>
<td></td>
<td>Acupuncture*</td>
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<td></td>
<td>TENS*</td>
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</tbody>
</table>

*Only recommended when patient has chronic moderate to severe pain and is a candidate for a total knee arthroplasty but either is unwilling to undergo the procedure, has comorbid medical conditions, or is taking concomitant medication that leads to a relative or absolute contraindication to surgery or a decision by the surgeon not to recommend the procedure.

ACR, American College of Rheumatology; TENS, transcutaneous electrical nerve stimulation
<table>
<thead>
<tr>
<th>Holistic Assessment</th>
<th>Acetaminophen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider Comorbidities</td>
<td>Topical NSAIDs, capsaicin</td>
</tr>
<tr>
<td>Education</td>
<td>NSAIDs, Cox 2 + PPI</td>
</tr>
<tr>
<td>Exercise</td>
<td>Corticosteroid Injections</td>
</tr>
<tr>
<td>Weight loss*</td>
<td>Opioid analgesics</td>
</tr>
<tr>
<td>Heat/Ice</td>
<td>No glucosamine</td>
</tr>
<tr>
<td>Manual therapy TENS</td>
<td>No chondroitin</td>
</tr>
<tr>
<td>Assistive devices</td>
<td>No acupuncture</td>
</tr>
<tr>
<td>Footwear/insoles</td>
<td>No arthroscopy unless locking*</td>
</tr>
<tr>
<td></td>
<td>No hyaluronate injections</td>
</tr>
<tr>
<td></td>
<td>Consider Joint Replacement*</td>
</tr>
</tbody>
</table>

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OARSI Guidelines

- Osteo
- Arthritis
- Research
- Society
- International
- 2005 Initiative

- 16 experts
- 2 Continents
- 16 Countries
- Lit review > 50 modalities
- Consensus
- 2007: 23 Guidelines
- Latest update: 2014

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16 experts reviewed 51 potential treatment modalities:

- Percentage of other guidelines that include it
- AGREE score for quality of evidence in literature
- Level of evidence/ LoE (I – IV; lowest to highest)
- Effect size for pain, function & stiffness
- Relative risk and odds risk (RR/OR)
- QUALY (Cost per quality life year gained.)
Consensus
  - The degree to which the Experts agreed

SOR: (strength of evidence)
  - How the Experts rated it

LoE: (levels of evidence):
  - Kinds of studies supporting the recommendation
Levels of Evidence

• Ia: Meta-analysis of Randomized Controlled Trials
• Ib: Randomized Controlled Trials

• IIa: Controlled study without randomization;
• IIb: Quasi-experimental study (e.g., uncontrolled trial)

• III: Observational studies (e.g., case–control, cohort, and cross-sectional studies)

• IV: Expert opinion
OARSI Guidelines for the Non-surgical Management of Knee OA

Core Treatments
Appropriate for all individuals
- Land-based exercise
- Water-based exercise
- Weight management
- Self-mgmt and education
- Strength training

Recommended treatments*
Appropriate for the following OA types:

Knee-only OA without co-morbidities
- Biomechanical interventions
- Intra-articular Corticosteroids
- Topical NSAIDs
- Walking Cane
- Oral COX-2 Inhibitors (selective NSAIDs)
- Capsaicin
- Oral Non-selective NSAIDs
- Duloxetine
- Acetaminophen (Paracetamol)

Knee-only OA with co-morbidities
- Biomechanical interventions
- Walking Cane
- Intra-articular Corticosteroids
- Oral COX-2 Inhibitors (selective NSAIDs)

Multi-joint OA without co-morbidities
- Oral COX-2 Inhibitors (selective NSAIDs)
- Oral Non-selective NSAIDs
- Duloxetine
- Biomechanical interventions
- Acetaminophen (Paracetamol)

Multi-joint OA with co-morbidities
- Balneotherapy
- Biomechanical interventions
- Intra-articular Corticosteroids
- Oral COX-2 Inhibitors (selective NSAIDs)
- Duloxetine

*OARSI also recommends referral for consideration of open orthopedic surgery if more conservative treatment modalities are found ineffective.
1. Multi-Modal Approach

1. Optimal management of OA requires a combination of non-pharmacological and pharmacological modalities.

Consensus: 100%
Strength of Recommendation: 96
Level of Evidence: IV
2. Education

• All patients with hip and knee OA should be given information access and education about the objectives of treatment and the importance of changes in lifestyle, exercise, pacing of activities, weight reduction, and other measures to unload the damaged joint(s).

• Consensus: 92   Strength of Recommendation: 95

• **Level of Evidence: 1a**
2a. Education

- Initial focus on self help
- Patient-driven treatments vs passive therapies delivered by professionals.
- On-going encouragement of adherence to non-pharmacological therapy & self care
- Level of evidence: IV
The clinical status of patients with hip or knee OA can be improved if patients are contacted regularly by phone.

Consensus: 77%   Strength of Recommendation: 66

Level of evidence: 1a
Patients with symptomatic hip and knee OA may benefit from referral to a physical therapist for evaluation and instruction in appropriate exercises to reduce pain and improve functional capacity. This evaluation may result in provision of assistive devices such as canes and walkers, as appropriate.

Consensus: 100      SOR:  89      LoE: IV
Patients with hip and knee OA should be encouraged to undertake, and continue to undertake, regular aerobic, muscle strengthening and range of motion exercises. For patients with symptomatic hip OA, exercises in water can be effective.

Consensus: 96   SOR: 85

LoE Knee: la   Hip: IV   Hip (aquatic): Ib
Land-based Exercise Benefit and Risk Scores

Knee-only OA without co-morbidities
- Benefit score: 3.00
- Risk score: 6.00
- Treatment Appropriateness: Appropriate

Knee-only OA with co-morbidities
- Benefit score: 3.00
- Risk score: 6.00
- Treatment Appropriateness: Appropriate

Multi-joint type OA without co-morbidities
- Benefit score: 3.00
- Risk score: 6.00
- Treatment Appropriateness: Appropriate

Multi-joint type OA with co-morbidities
- Benefit score: 3.00
- Risk score: 6.00
- Treatment Appropriateness: Appropriate
Strength Training Benefit and Risk Scores

- Knee-only OA without co-morbidities
  - Benefit Score: -3.00
  - Risk Score: 6.00
  - Benefit Appropriateness: Appropriate

- Knee-only OA with co-morbidities
  - Benefit Score: -6.00
  - Risk Score: 9.00
  - Benefit Appropriateness: Appropriate

- Multi-joint type OA without co-morbidities
  - Benefit Score: -6.00
  - Risk Score: 9.00
  - Benefit Appropriateness: Appropriate

- Multi-joint type OA with co-morbidities
  - Benefit Score: -9.00
  - Risk Score: 10.00
  - Benefit Appropriateness: Appropriate
6. Weight Management

• Patients with hip and knee OA, who are overweight, should be encouraged to lose weight and maintain their weight at a lower level.

• Consensus: 96   SOR: 100   LoE: 1a
Weight Management
Benefit and Risk Scores

<table>
<thead>
<tr>
<th>Condition</th>
<th>Benefit Scores (1-10)</th>
<th>Risk Scores (1-10)</th>
<th>Treatment Appropriateness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee-only OA without co-morbidities</td>
<td></td>
<td></td>
<td>Appropriate</td>
</tr>
<tr>
<td>Knee-only OA with co-morbidities</td>
<td></td>
<td></td>
<td>Appropriate</td>
</tr>
<tr>
<td>Multi-joint type OA without co-morbidities</td>
<td></td>
<td></td>
<td>Appropriate</td>
</tr>
<tr>
<td>Multi-joint type OA with co-morbidities</td>
<td></td>
<td></td>
<td>Appropriate</td>
</tr>
</tbody>
</table>
7. Walking Aids

- Walking aids can reduce pain in patients with hip and knee OA. Patients should be given instruction in the optimal use of a cane or crutch in the contralateral hand. Frames or wheeled walkers are often preferable for those with bilateral disease.

- Consensus: 90  SOR: 100  LoE: IV
In patients with knee OA and mild/moderate varus or valgus instability, a knee brace can reduce pain, improve stability and diminish the risk of falling.

Consensus: 76   SOR: 92   LoE: Ia
Every patient with hip or knee OA should receive advice concerning appropriate footwear. In patients with knee OA insoles can reduce pain and improve ambulation. Lateral wedged insoles can be of symptomatic benefit for some patients with medial tibio-femoral compartment OA.

Consensus 77   SOR 92   LoA IV (footwear) la (insole)
• Some thermal modalities may be effective for relieving symptoms in hip and knee OA.

• Consensus: 64   SOR: 77   LoE: Ia
11. TENS
Transcutaneous Electrical Nerve Stimulation

• TENS can help with short-term pain control in some patients with hip or knee OA.

• LoE: Ia  SOR: 69  Consensus: 58

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12. Acupuncture

• Acupuncture may be of symptomatic benefit in patients with knee OA.

• LoE: Ia    SOR: 69    Consensus 59
Acupuncture Benefit and Risk Scores

- Knee-only OA without co-morbidities
  - Benefit score
  - Risk score
  - Treatment Appropriateness: Uncertain

- Knee-only OA with co-morbidities
  - Benefit score
  - Risk score
  - Treatment Appropriateness: Uncertain

- Multi-joint type OA without co-morbidities
  - Benefit score
  - Risk score
  - Treatment Appropriateness: Uncertain

- Multi-joint type OA with co-morbidities
  - Benefit score
  - Risk score
  - Treatment Appropriateness: Uncertain
Balneotherapy (defined as the use of baths containing thermal mineral waters) includes practices such as Dead Sea salt or mineral baths, sulfur baths, and radon-carbon dioxide baths.

No significant safety concerns were found to be associated with balneotherapy, though reporting of adverse events was patchy among included trials7,9.

In the voting, balneotherapy was considered appropriate only for the sub-phenotype with multiple-joint OA and co-morbidities, due to paucity of treatment alternatives for that group.

LoE: SR & meta-analysis of RCTs   SOR - Fair
Two 2010 SRs suggested a possible beneficial effect of ultrasound for knee OA; The quality of the analyzed evidence was low. No safety risks were reported to be associated with ultrasound. A 2012 RCT found no significant differences between the groups for pain or function. **LoE: 1a**
Ultrasound Benefit and Risk Scores

<table>
<thead>
<tr>
<th>Condition</th>
<th>Benefit Score</th>
<th>Risk Score</th>
<th>Treatment Appropriateness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee-only OA without co-morbidities</td>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td>Knee-only OA with co-morbidities</td>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td>Multi-joint type OA without co-morbidities</td>
<td></td>
<td></td>
<td>Not Appropriate</td>
</tr>
<tr>
<td>Multi-joint type OA with co-morbidities</td>
<td></td>
<td></td>
<td>Not Appropriate</td>
</tr>
</tbody>
</table>

Risk Scores (1-10) Benefit Scores (1-10)
Pharmacological Modalities
13. Acetaminophen

- Acetaminophen (up to 4 g/day) can be an effective initial oral analgesic for treatment of mild to moderate pain in patients with knee or hip OA. In the absence of an adequate response, or in the presence of severe pain and/or inflammation, alternative pharmacologic therapy should be considered based on relative efficacy and safety, as well as concomitant medications and co-morbidities.

- **LoE: la (knee)**  SOR: 77  Consensus: 92
-   IV (hip)
Acetaminophen (Paracetamol)
Benefit and Risk Scores

Knee-only OA without co-morbidities
- Benefit score: 3.00
- Risk score: 6.00
- Treatment Appropriateness: Appropriate

Knee-only OA with co-morbidities
- Benefit score: 3.00
- Risk score: 6.00
- Treatment Appropriateness: Uncertain

Multi-joint type OA without co-morbidities
- Benefit score: 3.00
- Risk score: 6.00
- Treatment Appropriateness: Appropriate

Multi-joint type OA with co-morbidities
- Benefit score: 3.00
- Risk score: 6.00
- Treatment Appropriateness: Uncertain
Avocado Soybean Unsaponifiables (ASU)

- **Origin**: Natural vegetable extract made from 1/3 avocado & 2/3 soybean oil.
- **Claims**: Slows the progression of osteoarthritis (OA).
- **What we know**: Blocks pro-inflammatory chemicals, prevents deterioration of synovial cells; may help regenerate normal connective tissue.
- **Dosage**: 300 mg daily – softgel
- **Safety**: No problems >15 years French gov’t study

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In patients with symptomatic hip or knee OA, non-steroidal anti-inflammatory drugs (NSAIDs) should be used at the lowest effective dose but their long-term use should be avoided if possible. In patients with increased GI risk, either a COX-2 selective agent or a non-selective NSAID with co-prescription of a PPI or misoprostol for gastroprotection may be considered, but NSAIDs, including both non-selective and COX-2 selective agents, should be used with caution in patients with CV risk factors.

**LoE la (knee)**

**LoE la (hip)**

SOR: 100  
Consensus: 93
15. Topical Analgesics

- Topical NSAIDs and capsaicin can be effective as adjuncitives and alternatives to oral analgesic/anti-inflammatory agents in knee OA.
  - LoE Ia (NSAIDs) SOR: 100 85 (75–95)
  - Ia (capsaicin)
IA injections with corticosteroids can be used in the treatment of hip or knee OA, and should be considered particularly when patients have moderate to severe pain not responding satisfactorily to oral analgesic/anti-inflammatory agents and in patients with symptomatic knee OA with effusions or other physical signs of local inflammation.

- LoE: Ib (hip)  
- SOR: 69  
- Consensus: 78

- la (knee)
Injections of IA hyaluronate may be useful in patients with knee or hip OA. They are characterised by delayed onset, but prolonged duration, of symptomatic benefit when compared to IA injections of corticosteroids.

- LoE: Ia (knee) Ia (hip)  
- SOR: 85  
- Consensus: 64
Treatment with glucosamine and/or chondroitin sulphate may provide symptomatic benefit in patients with knee OA. If no response is apparent within 6 months treatment should be discontinued.

- LoE: Ia (glucosamine)  SOR: 92  Consensus: 66
- Ia (chondroitin)
Glucosamine Benefit and Risk Scores

For symptom relief
- Knee-only OA without co-morbidities: Uncertain
- Knee-only OA with co-morbidities: Uncertain
- Multi-joint type OA without co-morbidities: Uncertain
- Multi-joint type OA with co-morbidities: Uncertain

For disease modification
- Knee-only OA without co-morbidities: Not Appropriate
- Knee-only OA with co-morbidities: Not Appropriate
- Multi-joint type OA without co-morbidities: Not Appropriate
- Multi-joint type OA with co-morbidities: Not Appropriate

Benefit score vs Risk score (1-10)
Chondroitin Benefit and Risk Scores

For symptom relief

Knee-only OA without co-morbidities
Knee-only OA with co-morbidities
Multi-joint type OA without co-morbidities
Multi-joint type OA with co-morbidities

For disease modification

Knee-only OA without co-morbidities
Knee-only OA with co-morbidities
Multi-joint type OA without co-morbidities
Multi-joint type OA with co-morbidities

Treatment Appropriateness

Uncertain
Uncertain
Uncertain
Uncertain

Benefit score
Risk score
Risk Scores (1-10)
Benefit Scores (1-10)
19. Glucosamine Sulfate, Chondroitin, and Diacerein
(For structure modifying effects)

• In patients with symptomatic knee OA glucosamine sulphate and chondroitin sulphate may have structure-modifying effects while diacerein may have structure-modifying effects in patients with symptomatic OA of the hip.

• LoE: Ib (knee) SOR: 69   Consensus: 41
• Ib (hip)
Chondroitin Benefit and Risk Scores

<table>
<thead>
<tr>
<th>Treatment Appropriateness</th>
<th>Benefit Scores (1-10)</th>
<th>Risk Scores (1-10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For symptom relief</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knee-only OA without co-morbidities</td>
<td></td>
<td></td>
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<tr>
<td>Knee-only OA with co-morbidities</td>
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<tr>
<td>Multi-joint type OA without co-morbidities</td>
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<td></td>
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<tr>
<td>Multi-joint type OA with co-morbidities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncertain</td>
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</tbody>
</table>

For disease modification

<table>
<thead>
<tr>
<th>Treatment Appropriateness</th>
<th>Benefit Scores (1-10)</th>
<th>Risk Scores (1-10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee-only OA without co-morbidities</td>
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<tr>
<td>Multi-joint type OA without co-morbidities</td>
<td></td>
<td></td>
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<tr>
<td>Multi-joint type OA with co-morbidities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Appropriate</td>
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</tbody>
</table>
The use of weak opioids and narcotic analgesics can be considered for the treatment of refractory pain in patients with hip or knee OA, where other pharmacological agents have been ineffective, or are contraindicated. Stronger opioids should only be used for the management of severe pain in exceptional circumstances. Non-pharmacological therapies should be continued in such patients and surgical treatments should be considered.

- **LoE: la (week opioids)**
- **SOR: 92**
- **Consensus: 82**
- IV (strong opioids)
- IV (others)
Glucosamine Benefit and Risk Scores

For symptom relief
- Knee-only OA without co-morbidities
- Knee-only OA with co-morbidities
- Multi-joint type OA without co-morbidities
- Multi-joint type OA with co-morbidities

For disease modification
- Knee-only OA without co-morbidities
- Knee-only OA with co-morbidities
- Multi-joint type OA without co-morbidities
- Multi-joint type OA with co-morbidities

Risk Scores (1-10)
- Benefit scores
- Risk score

Treatment Appropriateness
- Uncertain
- Uncertain
- Uncertain
- Not Appropriate
- Not Appropriate
- Not Appropriate

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Oral Opioids
Benefit and Risk Scores

Knee-only OA without co-morbidities

Knee-only OA with co-morbidities

Multi-joint type OA without co-morbidities

Multi-joint type OA with co-morbidities

Benefit score

Risk Scores (1-10)

Benefit Scores (1-10)

Treatment Appropriateness

Uncertain

Uncertain

Uncertain

Uncertain

Terms and Conditions
Patients with hip or knee OA who are not obtaining adequate pain relief and functional improvement from a combination of non-pharmacological and pharmacological treatment should be considered for joint replacement surgery. Replacement arthroplasties are effective, and cost-effective interventions for patients with significant symptoms, and/or functional limitations associated with a reduced health-related quality of life, despite conservative therapy.

LoE:III    SOR: 92    Consensus: 96
• Patients with hip or knee OA who are not obtaining adequate pain relief and functional improvement from a combination of non-pharmacological and pharmacological treatment should be considered for joint replacement surgery. Replacement arthroplasties are effective, and cost-effective interventions for patients with significant symptoms, and/or functional limitations associated with a reduced health-related quality of life, despite conservative therapy.

• LoE: III  SOR:  92  Consensus: 96
Unicompartmental knee replacement is effective in patients with knee OA restricted to a single compartment.

LoE: IIb   SOR: 100   Consensus: 76
Osteotomy and joint preserving surgical procedures should be considered in young adults with symptomatic hip OA, especially in the presence of dysplasia. For the young and physically active patient with significant symptoms from unicompartmental knee OA, high tibial osteotomy may offer an alternative intervention that delays the need for joint replacement some 10 years.

LoE: lib   SOR: 100   Consensus: 75
The role of joint lavage and arthroscopic debridement in knee OA are controversial. Although some studies have demonstrated short-term symptom relief, others suggest that improvement in symptoms could be attributable to a placebo effect.

- LoE: Ib (lavage) SOR:100 Consensus:60
- LoE: Ib (debridement)
• In patients with OA of the knee, joint fusion can be considered as a salvage procedure when joint replacement has failed.

• LoE: IV   SOR: 100   Consensus: 69
<table>
<thead>
<tr>
<th></th>
<th>&gt; 90/90</th>
<th>&gt; 75/75</th>
<th>60/60</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td>Education</td>
<td>Exercise (85/96)</td>
<td>Phone Contact (66/77)</td>
</tr>
<tr>
<td><strong>Weight Management</strong></td>
<td>Weight Management</td>
<td>Bracing (92/76)</td>
<td>Heat &amp; Cold (77/64)</td>
</tr>
<tr>
<td><strong>NSAIDS</strong>*</td>
<td>NSAIDS*</td>
<td>Insoles (92/77)</td>
<td>TENS (69/58)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Acetamin (77/92)</strong></td>
<td>Acupuncture (69/59)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Opioids (92/82) ***</td>
<td>Ster. Injections (69/78)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topicals (100/85)</td>
<td>Viscosupp Inj. (85/64)</td>
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*www.jacksonortho.org*
OARSI Guidelines for the Non-surgical Management of Knee OA

Core Treatments
Appropriate for all individuals

- Land-based exercise
- Weight management
- Strength training
- Water-based exercise
- Self-mgmt and education

Recommended treatments*
Appropriate for the following OA types:

Knee-only OA without co-morbidities
- Biomechanical interventions
- Intra-articular Corticosteroids
- Topical NSAIDs
- Walking Cane
- Oral COX-2 Inhibitors (selective NSAIDs)
- Capsaicin
- Oral Non-selective NSAIDs
- Duloxetine
- Acetaminophen (Paracetamol)

Knee-only OA with co-morbidities
- Biomechanical interventions
- Walking Cane
- Intra-articular Corticosteroids

Multi-joint OA without co-morbidities
- Oral COX-2 Inhibitors (selective NSAIDs)
- Intra-articular Corticosteroids
- Oral Non-selective NSAIDs
- Duloxetine
- Biomechanical interventions
- Acetaminophen (Paracetamol)

Multi-joint OA with co-morbidities
- Balneotherapy
- Biomechanical interventions
- Intra-articular Corticosteroids
- Oral COX-2 Inhibitors (selective NSAIDs)
- Duloxetine

*OARSI also recommends referral for consideration of open orthopedic surgery if more conservative treatment modalities are found ineffective.
OARSI GUIDELINES

- OARSI guidelines for the non-surgical management of knee osteoarthritis


- Osteoarthritis and Cartilage

- Volume 22, Issue 3, Pages 363-388 (March 2014)
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More information at:

OrthoPrimaryCare.Info

www.jacksonortho.org
Thank You