Nonsurgical Management of Hip & Knee Arthritis: NSAIDS, Injections and the Use of Ultrasound

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Disclosures

- I have no financial disclosures pertinent to this presentation.

Objectives

- Review evidence-based guidelines re: non-surgical management of hip & knee osteoarthritis
  - NSAIDs/analgesics
  - Intra-articular injections (corticosteroids, viscosupplementation, platelet-rich plasma)
- Compare the accuracy, efficacy, and cost-effectiveness of ultrasound-guided vs. landmark-guided injections
Hip & Knee OA: NSAIDs, Injections, US

**No AAOS-endorsed guideline on Tx of Hip OA currently**

? Late 2015??

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**THE AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS**

**EVIDENCE-BASED GUIDELINE ON**

**Treatment of Osteoarthritis of the Knee, 2nd Edition**

David S. Iannotti, MD, MBA
Craig L. Anzalone, MD, PhD
Dania C. Aroca, MD
Elizabeth S. Aleman, MD
Paul G. Whalen, MD, FRSC
Nam J. Moon, MD
Dana E. Schnitz, MD, PhD
Steven N. Stover, MD
James G. Sanders, MD
Kevin J. Beley, MD, MBA
Michael J. Costigan, MD
William E. Martin, II, MD
Holly G. Lipp, MD
Patrick Donehoo, MD
Anna L. Vercruysse, MD
Lee B. Gross, MPH

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**Hip & Knee OA: NSAI Ds, Injections, US**

**2013 AAOS Guideline**

<table>
<thead>
<tr>
<th>Pharmacological Treatments</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonsteroidal anti-inflammatory drugs (NSAIDs), oral or topical</td>
<td>Strong</td>
</tr>
<tr>
<td>Toward treatment of patients with symptomatic osteoarthritis of the knee: Strength of Recommendation: Strong</td>
<td></td>
</tr>
</tbody>
</table>

**2010 AAOS Guideline**

<table>
<thead>
<tr>
<th>Pain Relief</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommendation 19</strong> We suggest patients with symptomatic OA of the knee receive one of the following analgesics for pain relief after nonpharmacologic interventions and before consideration of surgery:</td>
</tr>
<tr>
<td>Acetaminophen (not to exceed 4 grams per day)</td>
</tr>
<tr>
<td>Nonsteroidal anti-inflammatory drugs (NSAIDs)</td>
</tr>
</tbody>
</table>

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**NSAID’s, Analgesics**

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**2013 AAOS Guideline**

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**2010 AAOS Guideline**

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**CURRENT TOPICS IN ACTIVE ADULT HIP AND KNEE ORTHOPEDICS FOR THE PRIMARY CARE PROVIDER**

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**11/20/2015**
**NSAIDs**
- Some pts respond better to one NSAID vs. another.
- Topical (e.g., diclofenac 1% gel) modestly effective, ↓ risk systemic fx.
- COX-2 inhibitors: fewer GI adv fx, but costly, ↑ CV risk.

**Tramadol**
- Opioid agonist, FDA-approved for mod-severe chronic pain.
- Adv fx: N/V, constipation, dizziness, somnolence, SE, physical dependence.

**Acetaminophen**
- Less effective vs. NSAID's, but fewer adv fx.
- No data that 1g/dose more effective than 650 mg/dose.

**Opioids**
- Cautions! Only if contraindications, adv fx.

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**Hip & Knee OA**

**Intra-articular Injections (CS, HA, PRP)**

**2013 AOS Guideline**
- We are unable to recommend for or against the use of intra-articular (IA) corticosteroids for patients with symptomatic osteoarthritis of the knee. Strength of Recommendations: Inconclusive

**RECOMMENDATION A**
- We recommend using hyaluronic acid for patients with symptomatic osteoarthritis of the knee. Strength of Recommendations: Strong, Class 1B.

**RECOMMENDATION B**
- We are unable to recommend for or against the use of IA hyaluronic acid for patients with osteoarthritis of the knee. Strength of Recommendations: Inconclusive.

**Intra-Articular Injections**

**2010 AOS Guideline**
- Recommendation 15: We suggest intra-articular corticosteroids for short-term pain relief for patients with symptomatic OA of the knee.
  - Level of Evidence: II, Grade of Recommendation: B
- Recommendation 16: We cannot recommend for or against the use of intra-articular hyaluronic acid for patients with OA of the knee.
  - Level of Evidence: I and II, 1 RCT, 6 systematic reviews
  - Grade of Recommendation: Inconclusive

**Corticosteroids**
- AAOS 2013 unable to recommend for/against; ACR '12, OARSI '14, Cochrane GR '15 still recommend.
- "Short term relief": 4-8 weeks, up to 26 weeks?
- Limit to 4 injections annually.

**Viscosupplementation (hyaluronic acid)**
- AAOS vs. OARSI vs. ACR vs. Cochrane review: efficacy debated, conflicting recommendations.
  - 85% of studies are industry-funded.
- No clear evidence supporting specific clinical criteria re: patient selection for HA.
  - Trial data: pts with late stage dx, pts > 65 yo less likely to benefit vs. younger pts, pts with weaker dx.
- 5-13 weeks, some residual effect at 24 weeks; f/u @ 6 mcs reasonable.

**Platelet-Rich Plasma (PRP)**
- Not recommended for hip, knee OA by any guideline (AAOS, OARSI, ACR).
Knee OA: Hyaluronic Acid

Trojan T et al., CJSM 2016 (ahead of print)

- Network meta-analysis of literature 1960-2014
- 11 articles met inclusion criteria
- Subjects receiving HA: 15%, and 11% more likely to respond to Tx by OMERACT-OARSI criteria vs. IAS or IAP (P<0.05 for both)
- AMSSM recommends:
  - HA for Kellgren and Lawrence (KL) grade II-III knee OA in > 60 yo pts (Quality of Evidence: HIGH)
  - Clinicians/researchers collect OMERACT-OARSI responder data to track individual response to HA
- AMSSM suggests:
  - HA for knee OA in < 60 yo pts (Quality of Evidence: MODERATE)

### Knee OA

<table>
<thead>
<tr>
<th>Treatment</th>
<th>ACR 2012</th>
<th>AAOS 2013</th>
<th>OARSI 2014</th>
<th>Cochrane SR</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDs (oral, topical)</td>
<td>Recommend</td>
<td>Recommend</td>
<td>Recommend</td>
<td>N/A</td>
</tr>
<tr>
<td>Acetaminophen vs. Tramadol</td>
<td>Acetaminophen</td>
<td>Tramadol</td>
<td>Acetaminophen To affect mostly. Tramadol benefits small, see L (2006)</td>
<td></td>
</tr>
<tr>
<td><strong>Opioids</strong></td>
<td>Recommend, if poor response to pharm. &amp; non-pharm. modalities, TJA not an option</td>
<td>Unable to recommend</td>
<td>Moderate improvement in pain, small improvement in function (2015)</td>
<td></td>
</tr>
<tr>
<td>IA corticosteroids</td>
<td>Recommend, if no response to oral NSAIDs/acetaminophen</td>
<td>Unable to recommend</td>
<td>Recommend (2010)</td>
<td></td>
</tr>
<tr>
<td>IA hyaluronic acid</td>
<td>Recommend</td>
<td>Unable to recommend</td>
<td>Recommend (2010)</td>
<td></td>
</tr>
<tr>
<td>IA platelet-rich plasma</td>
<td>Not discussed</td>
<td>Not discussed</td>
<td>N/A</td>
<td></td>
</tr>
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### Hip OA

<table>
<thead>
<tr>
<th>Treatment</th>
<th>OARSI 2008</th>
<th>ACR 2012</th>
<th>Cochrane SR</th>
<th>AAOS 2015?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDs (oral, topical)</td>
<td>Recommend</td>
<td>Recommend oral, but no topical</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Acetaminophen vs. Tramadol</td>
<td>Acetaminophen (up to 4 g/day)</td>
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<td>Acetaminophen To affect mostly. Tramadol benefits small, see L (2006)</td>
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</tr>
<tr>
<td><strong>Opioids</strong></td>
<td>Consider, if other pharmacologic agents ineffective/contra-indicated</td>
<td>Recommend, if poor response to pharm. &amp; non-pharm. modalities, TJA not an option</td>
<td>Small mean benefit contrained by significant intervention effect in fab (2014)</td>
<td></td>
</tr>
<tr>
<td>IA corticosteroids</td>
<td>Recommend</td>
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</table>
Hyp & Knee OA

US-guided injections

Position Statement

American Medical Society for Sports Medicine Position Statement: Interventional Musculoskeletal Ultrasound in Sports Medicine

Jonathan T. Finnoff, MD, FAMSA, M. Hall, MD, J. Erik Adams, MD, FAMSA, David Blevins, MD, FAMSA, Andrew L. Caccavelli, MD, FAMSA, William Detter, MD, FAMSA, and Jay Smith, MD, FAMSA

Clin J Sport Med. 2015

US guidance: does accuracy improve efficacy?

Table 1: Major Joint Injection Accuracy

<table>
<thead>
<tr>
<th>LID</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Injections performed on live subjects, accuracy confirmed with gold standard imaging OR systematic review of Level 1 studies</td>
</tr>
<tr>
<td>2</td>
<td>Injections performed on live subjects or cadavers, accuracy confirmed with non-gold standard imaging or dissection OR systematic review of Level 2 studies</td>
</tr>
<tr>
<td>3</td>
<td>Injections performed on cadavers, accuracy confirmed with non-gold standard imaging</td>
</tr>
<tr>
<td>4</td>
<td>Injections performed on ≤ 10 live subjects/cadavers, accuracy confirmed by clinical outcome OR retrospective case series</td>
</tr>
<tr>
<td>5</td>
<td>Case study or expert opinion</td>
</tr>
</tbody>
</table>


Hyp & Knee OA

US guidance: does accuracy improve efficacy?

Table 2: Major Joint Injection Efficacy

<table>
<thead>
<tr>
<th>LID</th>
<th>Major Joint Injection Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hip joint unknown, injections on cadavers and non-gold standard imaging</td>
</tr>
<tr>
<td>2</td>
<td>Hip joint known, injections on cadavers and non-gold standard imaging</td>
</tr>
<tr>
<td>3</td>
<td>Hip joint known, injections on live subjects and non-gold standard imaging</td>
</tr>
<tr>
<td>4</td>
<td>Hip joint known, injections on live subjects and gold standard imaging</td>
</tr>
<tr>
<td>5</td>
<td>Expert or retrospective case series</td>
</tr>
</tbody>
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US guidance: does accuracy improve efficacy?

**Ultrasound-Guided Injections (USGI) vs. Landmark-Guided Injections (LMGI) in Sports Medicine: Recommendations**

- **Accuracy**: A (preponderance of studies: large > intermed >> small jts)
- **Efficacy**: B (large jts, SA-SD bursa, carpal tunnel, 1st dorsal wrist compart)
- **Cost-Effectiveness**: B (only 4 studies; large jts, inflammed jts, carpal tunnel syndrome)

**Strength of Recommendation Taxonomy (SORT):**
- A. Consistent good-quality evidence
- B. Inconsistent or limited-quality evidence
- C. Consensus, dx-oriented evidence, usual practice, expert opinion, case series
Conclusions

- Evidence-based guidelines re: non-surgical management of hip & knee osteoarthritis continue to evolve
  - AAOS 2013 (knee), AAOS 2015 (hip)
  - NSAIDs, intra-articular CS generally still recommended
  - Hyaluronic acid, PRP safe but not endorsed by guidelines
- MSK US continues to be an attractive alternative to fluoroscopy for image-guided injections
  - Consider for:
    - joint/soft tissue injections in large/obese patients
    - patients who have failed to respond to landmark-guided injections (LMGI’s)
    - joints/soft tissue sites (e.g. GH joint, biceps tendon sheath) which have low accuracy with LMGI’s