Algorithm: Management of Hip & Knee Osteoarthritis

1. Adult person presents with hip or knee pain, suggestive of OA
2. Conduct a history and physical examination (Avoid the routine use of laboratory examinations, synovial fluid analyses, or MRI)
3. Confirm the presence of OA and assess severity of pain/functional limitations
4. Recommend core non-surgical therapies, considering risk vs. benefit assessment, patient preferences, and resources utilization:
   1. Physical therapy approaches
   2. Pharmacologic therapies
5. Recommend traditional manual, land-based, and aquatic physical therapy, as mono or adjunctive therapies
6. Has the patient’s pain or functional limitation improved to their satisfaction?
7. Yes
   8. Consider duloxetine or tramadol as an alternative or adjunct therapy to oral NSAIDs
5. Yes
   9. Has the patient’s pain or functional limitation improved to their satisfaction?
10. Yes
    11. Obtain weight-bearing plain radiographs within 6 months prior to referral for surgical consultation
12. No
    13. Refer for surgical consultation

Table 1-2

Table 2

Table 3

Table 4

Table 1

Drug | Recommendations
--- | ---
Acetaminophen | Ensure patient received no more than 4 grams per day from all sources, prescribed or non-prescribed. Prefer lower maximum dose (2 to 3 grams daily) in advanced age or patient with heavy alcohol use
Opioids | Toxicity/Dependence
NSAIDs | Avoid in patient with history of or at risk for cardiovascular or cerebrovascular disease (on ASA or consider adding ASA)
        | Avoid in patient with renal injury/disease
        | Consider addition of a proton-pump inhibitor (PPI) or misoprostol in patient at risk for serious upper gastrointestinal events
Topical capsaicin | Consider as alternative or adjunct in mild to moderate knee OA
Supplements or CAM modalities for treatment of OA | Insufficient evidence to support other nutritional supplements or CAM modalities for treatment of OA

TABLE 1-2 Consideration when Initiating NSAIDs (COX-2 selective inhibitor or nonselective NSAID)

Gl complication Risk: No or Low High

<table>
<thead>
<tr>
<th>Drug</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonselective NSAID (ibuprofen, naproxen, etc.)*</td>
<td>If possible, consider other treatment modalities. NSAID or salsalate + PPI or misoprostol Hospital admission for UGI bleeding (Very high risk): Celecoxib + PPI</td>
</tr>
<tr>
<td>NSAID or salsalate + PPI or misoprostol</td>
<td>If possible, consider other treatment modalities. Nonselective NSAID (naproxen)</td>
</tr>
</tbody>
</table>


TABLE 3 Intra-articular Injections

Consider intra-articular injection therapy in patient with refractory pain after core treatment:

Knee OA:
- Corticosteroid injections may be beneficial
- Insufficient evidence for hyaluronate/hylan injections

Hip OA:
- Consider imaging/ultrasound directed corticosteroid injection to reduce pain
- The use of hyaluronate/hylan injections is not recommended

TABLE 4 Referral to Surgery

Patient referred to surgery should:
- Failed non-surgical core therapy
- Have confirmed OA by weight bearing radiographs within 6 month prior to referral
- Desire surgery after discussion of risk and benefits
### TABLE 5: Pharmacologic Agents Dosages **

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand</th>
<th>Dose (mg)</th>
<th>Frequency (daily)</th>
<th>Max Daily Dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-aspirin, nonselective NSAIDs:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celecoxib</td>
<td>CELEREX</td>
<td>100-200</td>
<td>once or twice</td>
<td>200 mg for OA</td>
</tr>
<tr>
<td>Etodolac</td>
<td>generic only/IR</td>
<td>200</td>
<td>400</td>
<td>2-4 times</td>
</tr>
<tr>
<td>Meloxicam</td>
<td>Mobic/generic</td>
<td>7.5</td>
<td>15</td>
<td>once</td>
</tr>
<tr>
<td>Nabumetone</td>
<td>generic only</td>
<td>1000</td>
<td>2000</td>
<td>once</td>
</tr>
<tr>
<td>Diclofenac potassium sodium</td>
<td>generics</td>
<td>50</td>
<td>75</td>
<td>2-3 times</td>
</tr>
<tr>
<td>Diclofenac sodium</td>
<td>Voltaren XR</td>
<td>100</td>
<td>100</td>
<td>once</td>
</tr>
<tr>
<td>Mobic/generic</td>
<td>SIR</td>
<td>100</td>
<td>100</td>
<td>once</td>
</tr>
<tr>
<td>Tramadol (IR)</td>
<td>generics</td>
<td>25-50</td>
<td>100</td>
<td>every 4-6 hours</td>
</tr>
<tr>
<td><strong>Aspirin and Salicylate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin</td>
<td>several</td>
<td>1000</td>
<td>1000</td>
<td>2-3 times</td>
</tr>
<tr>
<td>Salicylate</td>
<td>several</td>
<td>50-750</td>
<td>500</td>
<td>2-3 times</td>
</tr>
<tr>
<td><strong>Acetaminophen</strong></td>
<td></td>
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<tr>
<td>Acetaminophen</td>
<td>several</td>
<td>650</td>
<td>1300</td>
<td>3-4 times</td>
</tr>
<tr>
<td><strong>Glucosamine &amp; Chondroitin</strong></td>
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<td></td>
</tr>
<tr>
<td>Glucosamine</td>
<td>several</td>
<td>500</td>
<td>750</td>
<td>3 times</td>
</tr>
<tr>
<td>Chondroitin</td>
<td>several</td>
<td>400</td>
<td>-</td>
<td>3 times</td>
</tr>
<tr>
<td><strong>Topical Therapies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capsaicin</td>
<td>generics</td>
<td>-</td>
<td>-</td>
<td>3-4 times</td>
</tr>
<tr>
<td>Diclofenac</td>
<td>Pennsaid</td>
<td>40 drops</td>
<td>40 drops</td>
<td>4 times</td>
</tr>
<tr>
<td>Flector</td>
<td>160</td>
<td>1 patch</td>
<td>160</td>
<td>1 patch</td>
</tr>
<tr>
<td>Solaraze</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Hyaluronic/Hylan Injections: Treatment Course</strong> (Each injection is given at weekly intervals)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**TABLE 5: Pharmacologic Agents Dosages (cont.)**

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand</th>
<th>Dose (mg)</th>
<th>Frequency (daily)</th>
<th>Max Daily Dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-aspirin, nonselective NSAIDs:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naproxen/EC</td>
<td>generics</td>
<td>250</td>
<td>500</td>
<td>twice</td>
</tr>
<tr>
<td>Naproxen Sodium</td>
<td>generics</td>
<td>275</td>
<td>550</td>
<td>twice</td>
</tr>
<tr>
<td>OXaprozin</td>
<td>Daypro/generics</td>
<td>1200</td>
<td>1800</td>
<td>once</td>
</tr>
<tr>
<td>Piracetam</td>
<td>Feldene/generics</td>
<td>10</td>
<td>20</td>
<td>once</td>
</tr>
<tr>
<td>Sulindac</td>
<td>Clinoril/generics</td>
<td>150</td>
<td>200</td>
<td>twice</td>
</tr>
<tr>
<td>Tolmetin</td>
<td>generic only</td>
<td>400-600</td>
<td>600</td>
<td>3 times</td>
</tr>
<tr>
<td>Tramadol (IR)</td>
<td>generics</td>
<td>30 for 1 week, increase to 60 mg once daily</td>
<td>60</td>
<td>once</td>
</tr>
<tr>
<td><strong>Other therapies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duloxetine</td>
<td>Cymbalta/generics</td>
<td>60</td>
<td>once</td>
<td>60 mg</td>
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<tr>
<td><strong>Supplements</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Acetaminophen</strong></td>
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</tbody>
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*The list may not be all-inclusive or may change with time as will generic availability. Refer to VA or DoD formularies for availability of agents or comparable agents.

For additional details on warnings and precautions, drug-drug interactions, etc., refer to the prescribing information for the individual agents of interest.

*All NSAIDs have the potential to increase the risk for cardiovascular (CV) events and therefore should be used at the lowest effective dose for the shortest possible duration. Naproxen has a neutral or lowest risk for adverse CV events. Use with caution or avoid use of NSAIDs in patients with renal impairment, history of gastrointestinal bleeding, uncontrolled hypertension, congestive heart failure, advanced liver diseases, known cardiovascular disease, patients receiving anticoagulants, etc.*