Osteoarthritis Tool

The Osteoarthritis (OA) Tool has been developed for primary care providers who are managing patients with new or recurrent joint pain consistent with OA in the hip, knee or hand. This tool will help clinicians identify symptoms and provide evidence-based, goal-oriented non-pharmacological and pharmacological management while identifying triggers for investigations or referrals.

Section 1: History

Question 1: Where is your patient's pain? (refer to Figure 1)

- If pain pattern matches blue joints, patient likely has osteoarthritis unless Question 2 & 3 are positive.
- If pain pattern matches orange joints, screen for inflammatory arthritis.

Question 2: Does your patient have morning stiffness in their joints that lasts greater than 30 minutes?

- If greater than 30 minutes, proceed to inflammatory screening.

- If yes, proceed to **Question 4.**
- If no, does your patient have pain with rest?
  - If yes, proceed to Red Flags.

Question 4: How does your patient describe their pain experience?[1]

☐ Early	Pain is characterized by occassional predictable sharp or other pain, usually brought on by a trigger (activity, repetition, sport) that eventually limited high impact or excessive activities, but has relatively little impact on daily activites.
☐ Moderate	Predictable pain is increasingly associated with unpredictable locking or buckling (knees) or other joint symptoms. The pain becomes more constant, and begins to affect daily activities, such as walking and climbing stairs.
☐ Advanced	Constant dull/aching pain is punctuated by short episodes of often unpredictable intense pain. This pattern of intermittent, intense and often unpredictable hip or knee pain results in significant avoidance of activities, including social and recreational activities.

Question 5: Is your patient avoiding ALL activities due to pain, stiffness or weakness?

- If yes, screen for Yellow Flags and administer PHQ-4

Question 6: Is your patient experiencing symptoms of joint instability, such as 'giving way', locking or repeated clicking?

- If no, proceed with OA Tool assessment.
- If yes, perform a complete joint examination to rule out cartilage+/- ligament pathology.

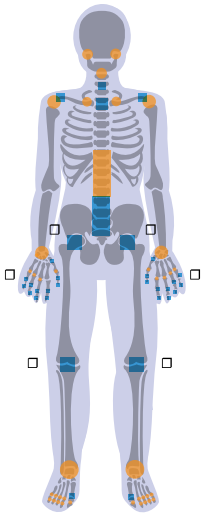
Question 7: Does your patient have any chronic disease co-morbidities including sleep disorders and/or mood disorders?

- If yes, consider co-morbidities with any prescribed management.

Criteria for inflammatory consideration[2]

- Pain increased with rest or immobility
- Persistent joint swelling and tenderness
- Frequent joint warmth and/or erythema
- Morning stiffness greater than 30 minutes
- Three or more joints affected
- Unexplained weight loss

Figure 1



- Systemic Inflammatory[3] (rheumatoid arthritis)
- Osteoarthritis[3]

RED FLAGS

Below is a list of serious pathologies to consider and rule out in assessing joint pain:[3]

	Indication	Investigation
Infection	Fever, meningism, history of immunosuppression/intravenous drug use	X-ray, MRI, CBC
Inflammatory	Rheumatoid arthritis, polymyalgia rheumatica, giant cell arteritis	Rheumatology consult plus laboratory (ESR, CRP and rheumatological markers)
Fracture	Osteoporotic fracture, traumatic fall with risk of fracture	X-ray, CT (if required)
Tumour	History of cancer, unexplained weight loss, significant night pain, severe fatigue	X-ray, MRI

YELLOW FLAGS

Psychosocial Risk Factors for Developing Chronicity

For those with joint pain lasting more than six weeks or non-responsive to treatment, consider asking:[5]

Questions to Ask	Look for
"Do you think your pain will improve or become worse?"	Belief that joint pain is harmful or potentially severely disabling
"Do you think you would benefit from activity, movement or exercise?"	Fear and avoidance of activity or movement
"How are you emotionally coping with your joint pain?"	Tendency to low mood and withdrawal from social interaction
"What treatments or activities do you think will help you recover?"	Expectation of passive treatment(s) rather than a belief that active participation will help
A patient with a positive Yellow Flag will benefit from education and reassurance to reduce risk of chronicity.	
If you are feeling symptoms of sadness or anxiety, this could be related to your condition and could impact your recovery, schedule a follow-up appointment.	

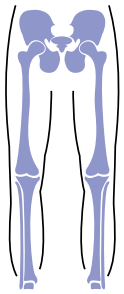
Section 2: Physical Examination

Patient Vitals			
Weight (kg):	Height (cm):	BMI [(weight in kg)/(height in m)^2]: See Management for related risks	Blood Pressure (mmHg): Consider before prescribing medication

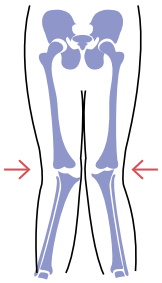
A. HIP AND KNEE EXAMINATION

Alignment/Deformities

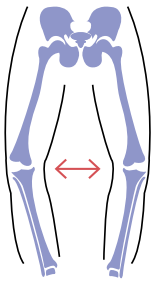
Check the standing alignment pattern that describes your patient:



☐ Normal



☐ Knock knees (valgus)



☐ Bowleggedness (varus)

Gait:

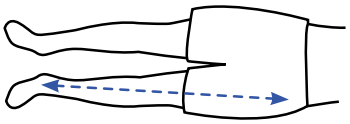
Does your patient limp when walking greater than 5 minutes?

If yes, ask if your patient has pain with limp? Consider appropriate pain management. If limp is persistent, consider a single point cane.

If pain persists and/or gait is asymmetrical due to limited joint mobility, consider using a wheeled walker.

If no, may have occasional limp when initiating walking and then normalizes, consider more active breaks with prolonged positioning.

If you suspect your patient has a leg length difference of greater than 1.5 cm, please validate with a screening measurement and refer if appropriate for shoe/insert modification.



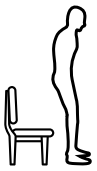
Knee Swelling (Bulge Test)

Palpate joint line for tenderness, while checking for swelling

Minimal	Moderate	Large
Minimal amount of fluid on joint	Noticeable fluid wave with bulge test	Fluid fullness is felt in compartment and does not easily move

Function & Strength: Sit to Stand Test[7]

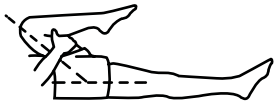
Early: Able to complete greater than 15 repetitions in 30 seconds



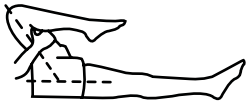
Moderate: Able to complete one to three repetitions in 30 seconds

Advanced: Unable to complete one repetition where neurological and cardiac function are normal

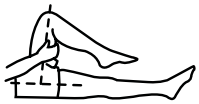
Hip Flexion



Early: > 115 degrees



Moderate: > 90-115 degrees



Advanced: < 90 degrees

Hip Internal Rotation[8]

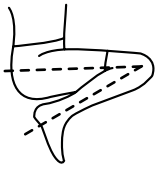
Early: Normal range with pain

Moderate: 5-10 degrees

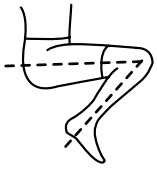
Advanced: Neutral position

Knee Flexion

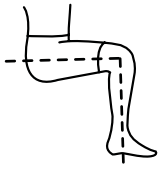
Knee flexion can be assessed sitting, standing or laying. Patella joint pain is best assessed in the standing quarter flexion



Early: > 115 degrees



Moderate: > 90-115 degrees



Advanced: < 90 degrees

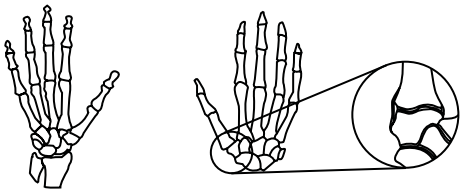
Meniscus Testing: Use the Thessaly Test[9]	
	• Screen for discrete meniscal pathology, may change management • A positive test is indicated by reports of pain on the joint line or by joint locking or catching • If positive do a full meniscal testing and imaging • The Thessaly test has higher sensitivity and specificity compared to the sensitivity and specificity of the Apley's test when assessing for meniscal tears

B. HAND EXAMINATION

Observations

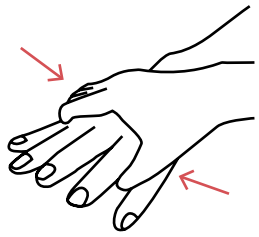
Assess for bilateral deformities and atrophy.

Multiple joint involvement will affect grip strength, and first finger and thumb involvement will affect pinch.



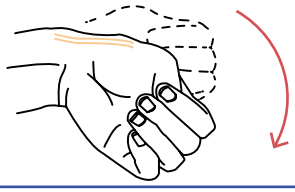
	Thumb	Index Finger (1st)	Middle Finger (2nd)	Ring Finger (4th)	Little Finger (5th)
Swelling and/or Tenderness	☐ CMC ☐ MCP ☐ PIP	☐ MCP ☐ PIP ☐ DIP	☐ MCP ☐ PIP ☐ DIP	☐ MCP ☐ PIP ☐ DIP	☐ MCP ☐ PIP ☐ DIP
Deformity	☐ CMC ☐ MCP ☐ PIP	☐ MCP ☐ PIP ☐ DIP	☐ MCP ☐ PIP ☐ DIP	☐ MCP ☐ PIP ☐ DIP	☐ MCP ☐ PIP ☐ DIP

Squeeze Test for Multiple Joint Pain[10]



If painful, consider multiple joint etiology.

Rule Out De Quervain's Tenosynovitis If Some Pain Is Present[11]



Positive: Pain with ulnar deviation of the wrist
If positive, treat specifically and consider association with inflammatory arthritis.

Negative: No pain with ulnar deviation
If negative, proceed with osteoarthritis management.

Function & Strength: Grip & Pinch[10]

Grip

Pinch

Score	Muscle Response	Score Grip	Score Pinch	Osteoarthritis Stage
5	**Maximum muscle contraction** **Grip:** Examiner cannot pull thumb away from patient grip **Pinch**: Examiner unable to separate thumb pinch position			Normal to early
4	**Good muscle contraction** **Grip**: Examiner can partially slide thumb from patient grip **Pinch**: Examiner can partially separate thumb pinch position			Early to moderate
3	**Moderate muscle contraction** **Grip**: Examiner can slide thumb from patient squeeze **Pinch**: Examiner can separate thumb pinch positions			Moderate
2	**Weak muscle contraction** **Grip**: Patient unable to fully squeeze examiner's thumb **Pinch**: Patient unable to hold a circular position between thumb and finger			Advanced
1	**Flicker of activity**			Not consistent with osteoarthritis
0	**No muscle contraction**			Not consistent with osteoarthritis

Section 3: Diagnosis

It is helpful to diagnosis osteoarthritis by the joint affected and clinical stage. Patients have reported that they find it helpful to know what joint(s) are affected and clinical stage(s). 'Staging' is based on the clinical assessment of function, mobility and joint examination. Determining clinical stage may guide management principles and assist patients to understand the clinical severity of their osteoarthritis.

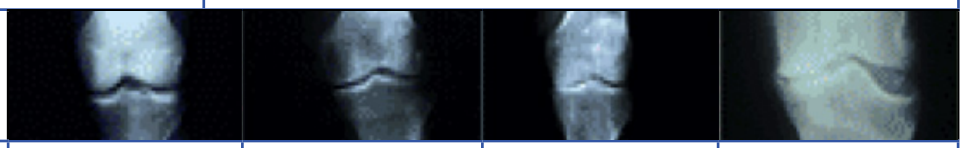
Clinical Assessment of Osteoarthritis Stage		
Hip ☐ Early ☐ Moderate ☐ Advance	Knee ☐ Early ☐ Moderate ☐ Advance	Hand ☐ Early ☐ Moderate ☐ Advance

Imaging
Has your patient had previous x-rays or MRI of the affected joints?

☐ Yes	
Date:	**Results:**
Imaging Type:	

☐ Advanced
Consider x-ray in the following circumstance • Failure to respond to evidence based management over 12 week period • Referral to rheumatology or orthopedic surgery

Kellgren and Lawrence Radiographic Criteria for Assessment of OA*[22]	
Correlation between clinical diagnosis and radiological staging may be useful when patients are not responding to treatment or potential surgical planning is required.	Mild/Early – Normal Joint space with definite osteophyte formation Moderate/ Mid – Moderate joint space reduction/ moderate multiple osteophytes Advanced/Severe – Joint space greatly reduced, subchondral sclerosis, large osteophytes, deformity of bone ends.



Radiographic grade	0	I	II	III	IV
Classification	Normal	Doubtful	Mild	Moderate	Severe
Description	No features of OA	Minute osteophyte; doubtful significance	Definite osteophyte: normal joint space	Moderate joint-space reduction	Joint space greatly reduced; subchondral sclerosis

*Radiography does not reliably correlate with symptoms

Referral	

Outpatient Rehabilitation Provider	• Any one of the following:
	  • Absence of red flags
	  • Patient whose medical pain management has been optimized to be able to engage in active exercises
	  • Patient who is open to implementing new information and/or strategies into their management program (e.g., goal setting, self-management focus)

Sport & Exercise Medicine Physician	• Patients who require a complete assessment to evaluate musculoskeletal pathology • Patients who need an assessment of exercise capacity and recommendations • Patients who require an integrated rehabilitation strategy including pain management
Pain Specialist	• High constant pain levels that interfere with activities and function • Presence of Yellow Flags • Patient who identifies active goals for treatment and self-management • Patient who is open to implementing new information into their management program • Patient who is on escalating / high doses of pain medications (e.g., opioids)
Rheumatologist	• Patients at risk for inflammatory arthritis • Small and large joint polyarthritis symptoms • Systemic symptoms (weight loss, fatigue) • Non-articular features such as rash, inflammatory bowel disease, or psoriasis
Orthopaedic Surgeon	• Patients with escalating pain medication and/or reduced effectiveness of pain management • Patient with significant reduction of joint mobility impacting activities of daily living and quality of life. • Failure of a 12-week compliant evidence-based treatment program

Management Matrix – Non-Pharmalogical

NON-PHARMACOLOGICAL

Hip & Knee

RECOMMENDED

Weight Management

- The relative risk is increased for BMI classified as overweight (1.8), obese (2.4) and very obese (3.2) as compared to normal weight[12]
- Achieving a weight loss of 5% of total body weight for effective treatment
- Refer to dietician if needed [12]

Physical Activity

- Recommend regular physical activity: promote activity as tolerated and if able, target 150 minutes total per week; aim for 30 minutes 5 days a week.[13]
- Encourage maintenance of strength and cardiovascular fitness through exercise and daily activity with appropriate pain management.[13]
- Choose activities that are easier for patient's joint(s) and patient preference, for example:
  - Cardiovascular and/or resistance land based exercise (e.g., walking, biking)
  - Neuromuscular control (e.g., Yoga, Tai Chi)
- For advanced OA consider aquatic exercises like swimming, aqua fit or walking in a pool
- Consider fitness planning and exercise prescription by a qualified rehabilitation therapist.

Assistive Devices

- Walking aids as needed (e.g., cane, walker or walking poles)
- A cane can help reduce the weight load in persons but needs to be properly fitted and used on the side contralateral to the affected joint
- Shock absorbing shoes (e.g., gel or silicone insoles)
- Knee underloader brace may be used in patients where one side of the joint is less affected than the other side

Joint Protection[24]

- Reduce risk of trauma with patient education
- Reduce the effort needed to do a task – use labour saving gadgets or equipment, avoid lifting heavy objects, reduce the weight on the affected joint
- Pace yourself, rest for 30-60 seconds every 5-10 minutes when stretching or moving joints
- Understand when the pain is worse during daily activities and suggest an action plan to minimize pain and increase daily activities
- Plan walks for places where there are benches to sit
- Keep joints in safe/neutral position, for example:
  - Avoid squatting, kneeling, twisting, low seats
  - Use raised toilet seats and raised bed
  - Reduce stress on joints while sleeping (e.g., firm mattress and pillow between the legs)

Self-Management

- Psychosocial interventions (e.g., cognitive behavioural therapy) may help with self-management of OA pain and function [14]
- Refer to Mental Health Counselor if available

Thermal Therapy

- Heat pad: 10 minutes on, 10 minutes off or 15-20 minutes on
- Avoid heat therapy when a malignancy or acute injury (e.g., open wounds, areas of recent bleeding, acute dermatitis, psoriasis, infection) is present

Hand

RECOMMENDED

Assistive Devices

- Hand or thumb splints can improve hand function and decrease pain, consider referral to therapies

Neuromuscular Training

- Aim for 8 repetitions of exercise, increase to 15-20 repetitions, 1-2 times per day
- Take a day off after strengthening
- Examples of hand Neuromuscular Training
  - Make a fist, spread fingers, opposing thumb to each fingertip

Joint Protection[24]

- Reduce risk of trauma with patient education
- Reduce the effort needed to do a task – use labour saving gadgets or equipment, avoid lifting heavy objects, reduce the weight on the affected joint
- Pace yourself, rest for 30-60 seconds every 5-10 minutes when stretching or moving joints
- Understand when the pain is worse during daily activities and suggest an action plan to minimize pain and increase daily activities
- Distribute the weight over several joints for example spread the load between 2 hands
- Avoid putting strain on the thumb(s), repetitive thumb movements, and/or prolonged grip in one position
- Use a large grip as possible

Self-Management

- Psychosocial interventions (e.g., cognitive behavioural therapy) may help with self-management of OA pain and function[14]
- Refer to a mental health counselor if available

Thermal Therapy

- Parrafin Wax[25]
- Heat pad: 10 minutes on, 10 minutes off or 15-20 minutes on
- Avoid heat therapy when a malignancy or acute injury (e.g., open wounds, areas of recent bleeding, acute dermatitis, psoriasis, infection) is present

Management Matrix – Pharmalogical

PHARMACOLOGICAL

Hip & Knee	Hand
RECOMMENDED **Topical** **Topical NSAIDs** • Knee OA Diclofenac sodium[14,15] • Dose: 50 drops per knee TID or 40 drops per knee qid **Analgesics** • Acetaminophen is recommended as 1st-line therapy for hip/knee OA[14,15,16,17] • Acetaminophen provides minimal pain relief and improvement in function for hip/knee OA (statistically significant, but clinically unimportant)[17,18] **Oral NSAIDs** • NSAIDs and COX-2 inhibitors are recommended for patients without contraindications (renal impairment, severe liver impairment, history of asthma or allergic-type reaction after taking NSAIDs or ASA, severe uncontrolled heart failure, active gastric duodenal or peptic ulcers and inflammatory disease, cerebrovascular bleeding and other bleeding disorders, or hyperkalemia)[14,15] **SNRI** • Duloxetine is recommended for knee OA[18] **Opioids** • Tramadol is recommended for hip and knee OA if it is in keeping with the patients' values and preferences.[13,14] • Non-tramadol opioids (oral oxycodone, transdermal buprenorphine, oral tapentadol, oral codeine, oral morphine, oral oxymoprhone, transdermal fentanyl, and oral hydromorphone) have a small effect on pain or physical function with more side effects[20,21] **Corticosteroids** • Intra-articular corticosteroid injections may provide short term pain relief for hip or knee OA.[14,15]	**RECOMMENDED** **Topical** **Topical NSAIDs[14]** • Hand OA Diclofenac diethylamine (1.16%, 2.32%) Dose: 2-4g applied tid-qid • Counterirritants Methyl Salicylate with Menthol or Camphor Apply tid-qid • Acetaminophen **Capasicin[14]** • Capsaicin for hand OA Capsaicin (0.025%, 0.075%). Apply tid-qid to unopened skin **Analgesics** • Acetaminophen is recommended as 1st-line therapy for hand[14,15,16,17] • Acetaminophen provides minimal pain relief and improvement in function for hand OA (statistically significant, but clinically unimportant)[17,18] **Oral NSAIDs** • NSAIDs and COX-2 inhibitors are recommended for patients without contraindications (renal impairment, severe liver impairment, history of asthma or allergic-type reaction after taking NSAIDs or ASA, severe uncontrolled heart failure, active gastric duodenal or peptic ulcers and inflammatory disease, cerebrovascular bleeding and other bleeding disorders, or hyperkalemia)[14,15] **Opioids** • Tramadol is recommended for hand OA if it is in keeping with the patients' values and preferences[14,15] • Non-tramadol opioids (oral oxycodone, transdermal buprenorphine, oral tapentadol, oral codeine, oral morphine, oral oxymorphone , transdermal fentanyl, and oral hydromorphone) have a small effect on pain or physical function with more side effects[20,21]
NOT RECOMMENDED • Capsaicin is not recommended for hip or knee OA[14,15] • Glucosamine not appropriate for disease modification but for symptom relief, the evidence is uncertain. • Chondroitin not appropriate[15] • Neuropathic pain modulators not recommended[15]	**NOT RECOMMENDED** • Intra-articular corticosteroid injections are not recommended for hand OA.[13] • Glucosamine not appropriate for disease modification but for symptom relief the evidence is uncertain.[15] • Chondroitin not appropriate[15] • Neuropathic pain modulators not recommended[15]
INCONCLUSIVE • Hip OA – no recommendation regarding the use of topical NSAIDS[13,14] • There are no consensus recommendations for the use of Intra-articular hyaluronates, Platlet Rich Plasma and Stem Cell therapy for hip or knee OA due to inconsistent conclusions among the meta-analyses[14,15] • Herbal remedies and supplements-inconclusive evidence for the use of these in the management of OA	**INCONCLUSIVE** • There are no recommendations for the use of Intra-articular hyaluronates for hand OA due to inconsistent conclusions among the meta-analyses[14,15] • Herbal remedies and supplements-inconclusive evidence for the use of these in the management of OA

Legend
tid-qid - 3 to 4 times a day

EVALUATING RESPONSE TO TREATMENT

Once appropriate management has been initiated, the patient should be re-assessed between 2-4 weeks initial to determine next steps to reach optimal function. The response to goal-oriented treatment can be used as a guide for further clinical decision-making.

Improvement	No Change	Worsening
• Reduce pain medications • Reinforce appropriate activity/exercise • Gradual progressive increase in exercise/ activity to achieve activity goals • Engage in comprehensive self management strategies • Advise to return for care if experiencing persistent swelling, pain or stiffness	• Re-assess Red Flags and Yellow Flags • Review exercise/activity to avoid overuse or excessive repetition and schedule frequent breaks and recovery positions • Review medication dosing, duration and consider next line of drug choice • Consider referral criteria for goal oriented out-patient rehabilitation provider • Re-assess Yellow Flags and if positive, consider referral to Pain Specialist/Pain Clinic • Follow up in 1-2 weeks to see if patient is achieving treatment response	• Re-assess Red Flags and consider referral criteria to rheumatologist. Evaluate need for investigations • Re-assess Yellow Flags and if positive, consider referral to Pain Specialist/Pain Clinic. • Reassess orthopaedic referral criteria for possible surgical assessment • Review all elements in "No Change" column and look for patient compliance or comprehension gaps • Set treatment priority goals and focus on one goal at a time to modify activities and progress at a slower pace

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