

EVALUATION AND MANAGEMENT OF OSTEOARTHRITIS OF THE HIP AND KNEE

**Federal Bureau of Prisons
Clinical Practice Guidelines**

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WHAT'S NEW IN THIS DOCUMENT?

All substantive changes in these guidelines since the version released in 2010 are highlighted in yellow throughout the document. Below is a summary of the key changes:

- **Weight criteria for surgical procedures:**
 - ▶ [Weight criteria](#) for consideration of arthroplasty have been clarified. Weight loss efforts are still required for inmates with a BMI ≥ 25 . Inmates with a BMI ≥ 35 will be expected to lose sufficient weight to reduce their BMI to < 35 . Inmates with a BMI ≥ 30 , but still < 35 , will be expected to demonstrate some weight loss and reasonable weight loss efforts—including a reduction of the high-calorie, low-nutrition food items purchased at the commissary.
 - ➔ See [weight loss](#) under Section 3, *Nonsurgical Management*.
 - ▶ These same weight criteria apply to requests for alternative surgical procedures for end-stage joint disease of the hip or knee.
- **Criteria for elective arthroplasty:** Functional limitations—despite optimized nonsurgical management—are the primary objective endpoint for consideration of arthroplasty of the hip or knee when the history, physical examination, and diagnostics are consistent with advanced osteoarthritis.
 - ➔ See [Section 4](#), *BOP Criteria for Consideration of Elective Arthroplasty*.
- **Transfer requests:**
 - ▶ To identify co-morbidities and other chronic medical problems, specific medical assessments must be performed and documented within six months of the request for transfer and addressed in the transfer request.
 - ➔ See [Other Medical Conditions](#) in Section 4.
 - ▶ Requests for transfer should be submitted as a Routine Care Level 4 request, unless the clinical condition dictates a more urgent transfer.

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1. PURPOSE

The primary purpose of this document is to outline a management strategy for Federal inmates with osteoarthritis (OA) of the hip or knee. This document provides a brief overview of the diagnosis and management of this condition, and is not intended to be a comprehensive review.

→ The reader is referred to the sources listed in the [References](#) section for more information.

2. OSTEOARTHRITIS: GENERAL CONSIDERATIONS

PATHOPHYSIOLOGY

Osteoarthritis is a degenerative arthrosis, primarily resulting from a failure of articular cartilage along with secondary inflammatory processes. The causes of OA are multifactorial and may include biochemical factors such as cytokines, calcium crystals, nitrous oxide, and proteases—as well as biomechanical factors such as internal joint derangements, muscle weakness, abnormal load bearing forces, and anatomical abnormalities. The most common initiating event is believed to be a traumatic injury to normal cartilage, either a single episode of macrotrauma or multiple episodes of microtrauma. Less commonly, an inherent cartilage defect is the inciting reason.

EPIDEMIOLOGY

Osteoarthritis is the most common of all joint disorders, affecting the majority of the older population to one degree or another. In general, it is a slowly progressive condition punctuated by intermittent symptom exacerbation. Risk factors for the development of OA include older age, female gender, heredity, obesity, occupations involving certain types of manual labor, certain sports, prior injuries, and other medical conditions such as acromegaly and calcium pyrophosphate deposition disease.

CLINICAL MANIFESTATIONS

Characteristic clinical features of OA include symptom onset after age 40, most commonly in the fingers, knees, hips, and spine. Elbows, shoulders, and wrists are less commonly affected. Patients usually present with pain that is worse with activity and relieved by rest. However, advanced disease may cause pain at night or at rest. When present, morning stiffness usually resolves in less than 30 minutes after awakening. “Gelling” refers to recurrent stiffness after periods of inactivity.

Common physical findings include bony enlargement, crepitus, joint effusion/swelling, malalignment, decreased range of motion, and tenderness. Synovial fluid is typically clear, with normal viscosity and WBC counts < 2,000/ml. A modest protein elevation may be found. Radiographic abnormalities such as joint space narrowing, osteophytes, subchondral cysts and/or sclerosis are commonly seen, but may be absent with early degenerative changes affecting the cartilage. Conversely, these radiographic abnormalities may be incidental findings in an asymptomatic patient.

DIAGNOSTIC EVALUATION

Osteoarthritis is a diagnosis that is made based on the presence of characteristic clinical findings. Although algorithms have been developed, no one test or constellation of tests has been established as a gold standard for diagnosing OA.

A good history and physical examination, along with a few labs and x-rays, are usually sufficient to make the diagnosis and should be documented in the medical record. Occasionally, joint fluid analysis, MRI, bone scan, or other special tests may be required.

→ For information on evaluating patients being considered for elective arthroplasty, see [Section 4](#), *BOP Criteria for Consideration of Elective Arthroplasty*

- **HISTORY** should include a thorough description of the pain and its effect on the patient’s functional status, non-articular symptoms associated with the pain, and the presence of any stiffness or gelling. Prior injury of the affected joint, duration of symptoms, and all treatments to date should be described. The presence or absence of subjective fever should be noted.
- **PHYSICAL EXAMINATION** should include vital signs, general appearance, and a thorough examination of the involved joint and surrounding structures—including the appearance of the overlying skin and soft tissues; the presence of any deformity, swelling, or atrophy; active and passive range of motion; gait; strength and sensory testing; tenderness to palpation of joint lines, bursae, bony prominences and soft tissues; examination of distal pulses in the involved extremity; and specialized examination techniques, as indicated.
- **DIAGNOSTIC TESTING**, in general, is limited to a few laboratory tests to rule out inflammatory causes of arthritis such as ESR, rheumatoid factor, and routine x-rays of the affected joint.
 - ▶ **X-rays of the knee** commonly include three views: standing anteroposterior (AP) view, lateral view, and tangential patellar view (a.k.a. “sunrise” or “Merchant” view).
 - ▶ **Standard views of the hip** include a weight bearing AP view of the pelvis, and AP and lateral views of the affected hip.

3. NONSURGICAL MANAGEMENT

The nonsurgical management of OA includes both pharmacologic and nonpharmacologic interventions. Operative intervention is considered elective in most cases and is reserved for end-stage disease that fails to respond to nonsurgical interventions (see [Section 4](#), *BOP Criteria for Consideration of Elective Arthroplasty*). A specific exception to the nonsurgical management requirement is hardware failure of a prior arthroplasty.

ORTHOPEDIC SPECIALTY CONSULTATION

Indications for specialty referral for consultation with a local/contract orthopedist include uncertain diagnosis or atypical presentation, signs of infection or fracture, an unstable joint, indications for intra-articular joint injections, or failure of nonsurgical interventions. An orthopedic consultation should be obtained prior to submitting a BEMR Consultation or **Re-Designation** request for arthroplasty.

NONPHARMACOLOGIC THERAPY

Nonpharmacologic therapy— individualized to the patient—includes activity restrictions, durable medical equipment, exercises, and weight loss.

- **ACTIVITY RESTRICTIONS** are an important aspect of treating severe joint disease. Decisions about specific restrictions must be made on a case-by-case basis by the treating clinician/Clinical Director, but should address the inmate’s need for a lower bunk and housing unit level, as well as work and activity restrictions (e.g., avoiding prolonged standing, heavy lifting, working at heights, etc.)
- **EXERCISES** are an important part of the ongoing management of OA, whether or not surgery is performed. A “home” exercise program of stretching and strengthening, provided by the treating clinician or formal physical therapy, may be effective in relieving pain and reducing functional limitations. As standardized exercise regimens become available for use by the BOP, they will be posted to the Health Services Division/Health Programs website on Sallyport.

The exercise regimen should be individually tailored to the patient’s condition. Adherence to an exercise regimen can be assessed by asking the patient to demonstrate the exercises during a follow-up office visit.

- **WEIGHT LOSS** should be recommended for patients with BMI ≥ 25 . Even modest amounts of weight loss may slow progression of the disease, reduce pain, and improve the functional status of the patient. In the case of surgical patients, obesity increases the risk for post-operative infection and venous thromboembolism/pulmonary embolism, as well as makes surgery technically more difficult. Inmates with a BMI ≥ 35 will be expected to lose sufficient weight to reduce their BMI to < 35 . Inmates with a BMI ≥ 30 , but still < 35 , will be expected to demonstrate some weight loss and reasonable weight loss efforts—including a reduction of the high-calorie, low-nutrition food items purchased at the commissary.

Exceptions to these criteria may be made on a case-by-case basis, as clinically indicated. When a BOP dietitian is not available at the local institution, tele-dietitian consultation will be made available for inmates who need specialized counseling in support of their weight loss efforts.

- **DURABLE MEDICAL EQUIPMENT (DME)** such as canes, crutches, or walkers is an integral part of the treatment of severe joint disease of the knee or hip. The use of DME may help reduce pain, facilitate exercise, and maintain function by assisting ambulation and reducing load on the affected joint. Bracing the knee may improve knee pain, but the clinical benefit appears to be small, and the impact on overall outcome is not known.

PHARMACOLOGIC TREATMENT OPTIONS

Pharmacologic treatment options include analgesics, nonsteroidal anti-inflammatory drugs (NSAIDs), intra-articular injections, and topical agents.

- **ANALGESICS** are classified into two broad categories, non-opioid and opioid:
 - ▶ **NON-OPIOID ANALGESICS**, e.g., acetaminophen, have demonstrated efficacy in the treatment of mild to moderate pain.
 - ▶ **OPIOID ANALGESICS** also are effective in treating the pain of OA. However, their long-term use is limited by the associated side effects, tolerance, and addiction. Opioids are best reserved for the short-term treatment of pain exacerbations and long-term treatment in patients with severe, intractable pain who are not candidates for arthroplasty, or who have a contraindication to NSAIDs.
- **NONSTEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDs)** have demonstrated efficacy in the treatment of moderate pain, may be more effective than acetaminophen, but can be associated with significant gastrointestinal or cardiovascular toxicities and may be contraindicated in some patients. Failure of NSAIDs to control or manage the pain of a patient with OA is the primary pharmacologic criteria that must be met for consideration of arthroplasty.
- **ORAL CORTICOSTEROIDS** do not have an established role in the routine treatment of OA.
- **INTRA-ARTICULAR INJECTIONS** of the knee with corticosteroids or hyaluronans may be effective in providing short-term relief of pain in some patients, comparable to the effectiveness of oral NSAID therapy; however, studies have not consistently demonstrated this benefit. Corticosteroid injection may be best utilized for the treatment of acute flares of pain. Some authors recommend against the use of hyaluronans. **Injection of the hip joint is technically difficult and is not routinely performed.** No study to date on the effectiveness of hip joint injections has demonstrated an alteration in the natural history or progression of disease. Intra-articular injections are optional interventions as clinically indicated, and are not a mandatory prerequisite for consideration of arthroplasty.
- **TOPICAL AGENTS**—including NSAIDs, capsaicin, and lidocaine—work by a variety of different mechanisms and may achieve short-term pain relief in some patients. Use of these agents in the BOP is governed by BOP National Formulary restrictions and is not required as part of the criteria for joint replacement surgery.

4. BOP CRITERIA FOR CONSIDERATION OF ELECTIVE ARTHROPLASTY

The rest of this document defines the BOP criteria for consideration of elective arthroplasty of the knee or hip. Operative intervention (e.g., with total joint arthroplasty) is considered elective in most cases and is reserved for end-stage disease that fails to respond to nonsurgical interventions. **Requests for alternative surgical procedures for end-stage joint disease of the hip or knee should also follow these procedures.**

→ See also [Appendix 1](#), Checklist for BOP Arthroplasty Criteria, and [Appendix 2](#), BOP Review Process for Elective Arthroplasty (Knee, Hip).

BOP CRITERIA FOR CONSIDERATION OF ELECTIVE ARTHROPLASTY

1. **History, physical examination, and diagnostics are consistent with advanced disease.**
AND
2. **Functional limitations from deformity or severe pain are refractory to maximized nonsurgical management for three to six months.**
AND
3. **No contraindications or exclusions are present.**

These three criteria are discussed below:

1. History, physical examination, and diagnostics are consistent with advanced disease:

- A thorough history of the patient’s symptoms and functional limitations should be documented; it should reveal pain that is consistent with a diagnosis of osteoarthritis, and that the pain is interfering with the patient’s activities of daily living (ADL).
- A targeted examination of the involved joint and surrounding structures should be documented and should reveal findings consistent with osteoarthritis—such as crepitus, painful and decreased passive ROM, and swelling (knee).
- Radiographs of the involved joint should reveal findings consistent with the diagnosis of osteoarthritis such as subchondral cysts or sclerosis, osteophytes, joint subluxation, or joint space narrowing.

→ See [Diagnostic Evaluation](#) in Section 2 for more information.

2. **Functional limitations from deformity or severe pain are refractory to maximized nonsurgical management for three to six months**, including both nonpharmacologic and pharmacologic interventions. **Functional limitations include abnormal gait and difficulty ambulating, as well as impaired ability to accomplish basic or instrumental ADLs.**

→ See [Section 3, Nonsurgical Management](#), which discusses nonpharmacologic and pharmacologic interventions.

3. No contraindications or exclusions are present.

Once a determination is made that the first two criteria above are met, the clinician should conduct and document a routine medical assessment to identify any contraindications, and an administrative review to identify any excluding factors.

→ A detailed discussion about preoperative medical assessment exceeds the scope of this document. Clinicians should refer to standard medical references for a more in-depth review.

Short-term and long-term contraindications to elective arthroplasty may include:

- ▶ Active infections
- ▶ Uncontrolled medical conditions or medical/surgical conditions of higher priority
- ▶ Limited life expectancy due to a terminal condition
- ▶ Severe debilitation unrelated to OA for which arthroplasty would not improve functional status or quality of life
- ▶ Concerns about the inmate's willingness to participate in the care management plan or logistical issues related to the inmate's Projected Release Date.

INFECTIONS: Consideration for elective surgery should be postponed in the presence of the following active infections:

- ▶ Infection of the joint itself or extra-articular infections such as chronic prostatitis
- ▶ Recurrent paronychia with onychocryptosis
- ▶ Dental carries
- ▶ Chronic/recurrent sinusitis
- ▶ Cellulitis or secondary infection of chronic skin conditions such as psoriasis or eczema

OTHER MEDICAL CONDITIONS: Certain co-morbidities and chronic medical problems should be evaluated and fairly well-controlled prior to considering elective arthroplasty.

Examples include, but are not limited to:

- ▶ Angina/coronary artery disease or other cardiovascular disorders
- ▶ Asthma/COPD or other pulmonary disorders
- ▶ Cerebrovascular disease/transient ischemic attacks
- ▶ Diabetes mellitus
- ▶ Hypertension
- ▶ Peripheral arterial disease
- ▶ Malignancy
- ▶ Decompensated hepatic cirrhosis
- ▶ End-stage renal disease

To identify such conditions, the following must be accomplished as part of the medical assessment—not more than six months prior to submitting the case for regional review:

- ▶ Cardiology evaluation for inmates with a known cardiac history of arrhythmia, coronary artery disease, or heart failure.
- ▶ Electrocardiogram (ECG) and chest x-ray (CXR) for inmates 50 years of age or older.
- ▶ Dental evaluation for all inmates, and treatment of caries or dental abscesses.

(Topic continues on next page.)

- ▶ CXR and pulmonary function testing (PFT) for all inmates with significant pulmonary disease, including COPD, pulmonary hypertension, sarcoidosis, sleep apnea, history of pneumothorax, etc. A pulmonology consult is required for abnormalities on the CXR or PFT.
- ▶ Urology evaluation for inmates with hematuria, benign prostatic hyperplasia, or urinary retention.

NON-MEDICAL ISSUES : Several other non-medical criteria must also be met when considering an inmate for arthroplasty.

- ▶ In general, a patient who is nonadherent to or unwilling to perform nonsurgical interventions will not be considered for arthroplasty.
- ▶ Similarly, an inmate's refusal to have surgical intervention will exclude that individual from consideration.
- ▶ The inmate's incident report history should be reviewed to identify frequent or serious violations of institution rules and regulations; such behavior could interfere with participation in pre- and post-operative management.
- ▶ Finally, inmates who have less than 18 months remaining on their sentence (12 months if already housed at an MRC) usually will not be considered as candidates for this procedure. Factors that could disrupt completion of the plan of care, and lead to suboptimal treatment outcomes, include: logistical constraints of a routine transfer for an elective procedure, the pre- and post-operative physical therapy requirements, and the potential for transfer to a halfway house 6 to 12 months from the Projected Release Date.

REFERENCES

American Academy of Orthopaedic Surgeons. Treatment of osteoarthritis of the knee: evidence-based guideline, 2nd edition. *J Am Acad Orthop Surg.* 2013;21(9):1–1200. Available at: <http://www.aaos.org/research/guidelines/TreatmentofOsteoarthritisoftheKneeGuideline.pdf>

Hochberg MC, Altman RD, April KT, et al. American College of Rheumatology 2012 recommendations for the use of nonpharmacologic and pharmacologic therapies in osteoarthritis of the hand, hip, and knee. *Arthritis Care Res.* 2012;64(4):465–474.

APPENDIX 1: CHECKLIST FOR BOP ARTHROPLASTY CRITERIA

- 1. **History, physical examination, and diagnostics are consistent with advanced disease.**
 - Pain is consistent with a diagnosis of osteoarthritis *AND* interferes with performance of ADLs.
 - Examination of the involved joint and surrounding structures reveals findings consistent with advanced osteoarthritis. Findings are documented.
 - Radiographs of the involved joint reveal findings consistent with the diagnosis of advanced osteoarthritis.

- 2. **Functional limitations are refractory to maximized nonsurgical management for three to six months.**
 - Activity restrictions appropriate to the diagnosis.
 - Exercises appropriate to the patient's condition.
 - Weight lost when BMI \geq 25. (A BMI $<$ 35 is required for surgical consideration in most cases.)
 - Durable medical equipment used (e.g., cane or walker).
 - Treatment with analgesics or NSAIDs.
 - Orthopedic consultation (local/contract).
 - A specific exception to the nonsurgical management requirement is hardware failure of a prior arthroplasty.

- 3. **No contraindications or exclusions are present. A medical assessment and an administrative review should be performed to rule out the presence of any of the following:**
 - NO** active infections.
 - ◆ *Dental evaluation and treatment for abscess or caries.*
 - ◆ *Urology evaluation if hematuria, BPH, or urinary retention are present.*
 - NO** uncontrolled medical conditions or medical/surgical conditions of higher priority.
Medical assessment—within six months of the request for transfer—must include:
 - ◆ *ECG and CXR for inmates \geq 50 years old.*
 - ◆ *Cardiology consult for ECG abnormalities, history of arrhythmia, CAD, heart failure.*
 - ◆ *CXR and PFT for known COPD, pulmonary hypertension, sarcoidosis, sleep apnea.*
 - ◆ *Pulmonology consult for abnormal CXR or PFT.*
 - Life expectancy **NOT** limited due to a terminal condition.
 - NO** severe debilitation unrelated to OA for which arthroplasty would not improve functional status or quality of life.
 - NO** problems with nonadherence or unwillingness to cooperate with nonsurgical interventions.
 - NO** refusal to have surgery performed.
 - NO** incident report history of frequent/serious violations.
 - Projected Release Date is **NOT** less than 18 months (12 months if already at an MRC).

APPENDIX 2: BOP REVIEW PROCESS FOR ELECTIVE ARTHROPLASTY (KNEE, HIP)

STEP	DECISION AND ACTION PLAN
STEP 1	Institution medical staff conducts clinical evaluation.* * Address all checklist items in Appendix 1 .
↓	<ul style="list-style-type: none"> • CRITERIA MET: Generate BEMR consultation request and refer to CD/local URC. → Go to STEP 2. • CRITERIA NOT MET: Confirm the diagnosis, continue non-surgical management, and notify inmate.
STEP 2	CD/Local URC reviews clinical evaluation.* * Address all checklist items in Appendix 1 .
↓	<ul style="list-style-type: none"> • CRITERIA MET: Refer BEMR Consultation Request to Region. (See Note 1 below.) → Go to STEP 3. • CRITERIA NOT MET: Confirm the diagnosis, continue non-surgical management, and notify inmate.
STEP 3	Regional Primary Reviewer (IOP/RN) generates an InterQual review.
↓	<ul style="list-style-type: none"> • CRITERIA MET: BEMR request is approved by Regional Primary Reviewer with comments to submit BEMR Re-Designation Referral Request for transfer of inmate to MRC. → Go to STEP 4. • CRITERIA NOT MET: Forward InterQual review to Regional Medical Director (RMD) for Secondary Medical Review. Follow standard BEMR/InterQual procedures; refer back to institution for additional information and/or non-surgical management. → Go to STEP 4 if approved by RMD.
STEP 4	Institution submits a BEMR Re-Designation Referral Request.
↓	<ul style="list-style-type: none"> • Transfer request must include all required documentation. (See Note 1 below.) • Transfer request reviewed and determination made by Central Office Physician or designee with BOP Orthopedic consultation, on a case-by-case basis. → Go to STEP 5.
STEP 5	OMDT completes Final Processing.
	<ul style="list-style-type: none"> • CRITERIA MET: Redesignation of inmate to an MRC; coordinate time of transfer to institution; and begin UR/LOS monitoring. (See Note 2 below.) • CRITERIA NOT MET: Final review by Chief, Health Programs; denial memo with reason and recommendation sent by OMDT.
(See Notes for Appendix 2 on the next page.)	

Appendix 2: BOP Review Process for Elective Arthroplasty (Knee, Hip) -- *continued*

NOTES:

1. The BEMR Consultation Request and the **BEMR Re-Designation Referral Request** (formerly the BP-A0770 Medical/Surgical and Psychiatric Referral Request) **should be submitted as a Routine Care Level 4 request, unless the clinical condition dictates a more urgent transfer.** The request must contain a thorough description of the following items, as outlined in greater detail in [Section 4](#), *BOP Criteria for Consideration of Elective Arthroplasty*, and [Appendix 1](#), *Checklist for BOP Arthroplasty Criteria*:
 - ▶ History, physical examination, and results of diagnostic tests pertinent to the inmate's condition and diagnoses.
 - ▶ Treatment interventions related to the osteoarthritis—including duration of, response to, and adherence to the various treatment modalities.
 - ▶ An assessment of whether BOP criteria for elective arthroplasty are met, and whether there are any contraindications or restrictions.
2. Arthroplasty cases will be redesignated as Routine Care Level 4 transfers.
 - ▶ Once redesignated, the Utilization Review Nurse/Consultant will begin tracking the case for various parameters, including length of time from redesignation to transfer, time to first visit with the Physical Therapist and Orthopedist, time to surgery and post-operative recovery period, overall length of stay and costs associated with the surgery.
 - ▶ In general, the receiving institution is expected to have the patient seen by a Physical Therapist within 30 days of arrival and by an Orthopedist within 60 days, whenever possible. **Once post-operative physical therapy and surgical follow-up is complete and documented in the respective notes, a Treatment Complete Transfer Request should be submitted expeditiously to OMDT.**
 - ▶ The HSA will need to provide to the Utilization Review Nurse/Consultant the total costs associated with the surgery/hospitalization and the total hospital days. This does not include the costs for outpatient consultations, follow-up appointments, or durable medical equipment.