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## What Are the Absolute Contraindications for Elective Total Knee or Hip Arthroplasty?



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### What are the absolute contraindications for elective total knee or hip arthroplasty?

**Response/Recommendation:** Modifiable absolute contraindications to performing elective total joint arthroplasty are symptomatic bacteremia, active joint or local tissue infection, severe malnutrition, uncontrolled metabolic syndrome or chronic diseases, untreated immunodeficiency, and active deep venous thrombosis (DVT) or pulmonary embolism. Nonmodifiable absolute contraindications are severe medical comorbidities precluding anesthesia and absence of intra-articular pathology.

**Agree 80.9%, Disagree 10.3%, Abstain 8.8%**

### Rationale

Absolute contraindications for elective total knee or hip arthroplasty can be categorized into modifiable and nonmodifiable risk factors. An absolute modifiable risk factor is defined as a risk factor that is associated with a preventable complication, thereby necessitating the postponement of surgery until the risk factor for

complication is appropriately evaluated and optimized. Alternatively, an absolute nonmodifiable risk factor is one that cannot be optimized, and thus precludes the patient from undergoing surgery. In such cases, alternative therapies for joint pain should be pursued. As a result of conducting this systematic review, various contraindications to elective total hip or knee arthroplasty were identified.

Consistently cited contraindications include active infection of the affected joint or limb and severe medical comorbidities precluding anesthesia, although these are not thoroughly specified [1–7]. Therefore, in patients who have symptomatic bacteremia, active joint infection such as pyogenic arthritis, or active local tissue infection such as cellulitis at the incision site, it should be absolutely delayed until the infections are treated or controlled. Other modifiable absolute contraindication regarding the risk of infection are uncontrolled conditions such as severe malnutrition (serum

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albumin < 3 g/dL, transferrin levels < 200 mg/dL [5–13], uncontrolled metabolic syndrome including morbid obesity (BMI > 50), and uncontrolled diabetes mellitus (hemoglobin A1c >8%) [14–17], while there remains room for further validation in establishing an appropriate cutoff value for serum albumin and transferrin levels, BMI, and hemoglobin A1c. Untreated immunodeficiency conditions, such as untreated human immunodeficiency virus, are also an absolute contraindication for elective total knee or hip arthroplasty. It is recommended that patients on HAART therapy maintain a pre-operative cluster of differentiation 4+ count of at least  $\geq 200$  or greater [18]. Uncontrolled chronic diseases such as end-stage renal disease requiring hemodialysis, liver cirrhosis (Child-Pugh C), uncontrolled congestive heart failure, and severe chronic obstructive pulmonary disease are modifiable absolute contraindications for elective total knee or hip arthroplasty [19–21]. A recent history of intra-articular injection, anemia, and tobacco or substance abuse do not constitute absolute contraindications but are factors that should be taken into account before surgery [22,23].

A number of articles have addressed risk factors contributing to mortality after elective hip and knee arthroplasty [24–38]. While the risk of early mortality after elective hip and knee arthroplasty is low (0.1 to 0.3% in the first 90 days) and has decreased over time, consistent risk factors that increase this risk have been described, including advanced age (greater than 90 years old), high comorbidity burdens, severe cardiopulmonary disease including ischemic heart disease, pulmonary hypertension, male sex, and frailty [25,28,30,31,33,37,39]. In addition, postoperative complications such as venous thromboembolism, cerebrovascular complications, and cardiac disease were the primary sources of mortality risk in the early postoperative period [6,10,13,21]. While all of them cannot be considered absolute contraindications for performing total hip or knee arthroplasty, they may be regarded as relative contraindications. However, active DVT, particularly involving the ilio-femoral or popliteal veins, is an absolute modifiable contraindication for elective hip and knee arthroplasty. Surgery can dislodge existing thrombi, leading to potentially life-threatening complications like pulmonary embolism. Anticoagulation therapy is typically initiated to manage the acute DVT, and elective total hip or knee arthroplasty should be postponed until the DVT resolves and the patient is on stable anti-coagulation for a sufficient period (typically three to six months) [40]. Also, severe medical comorbidities precluding anesthesia, including severe cardiopulmonary diseases, can be nonmodifiable absolute contraindications regarding the risk of mortality. In addition, the absence of intra-articular pathology is another nonmodifiable absolute contraindication for arthroplasty. Orthopaedic surgeons should conduct a thorough diagnosis and evaluation of extra-articular sources of pain before proceeding with joint arthroplasty surgery in order to avoid inappropriate surgical interventions.

## CRediT authorship contribution statement

**Hyonmin Choe:** Writing – review & editing, Writing – original draft, Supervision, Investigation, Formal analysis. **Pier Francesco Indelli:** Writing – original draft, Investigation. **Benjamin Ricciardi:** Writing – original draft, Methodology, Investigation. **Tae-Young Kim:** Writing – original draft, Investigation. **Yasuhiro Homma:** Writing – original draft, Investigation. **James Kigera:** Writing – original draft, Investigation. **Margarita Veloso Duran:** Writing – original draft, Investigation. **Tahir Khan:** Writing – review & editing, Writing – original draft, Methodology, Investigation.

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