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RESEARCH ARTICLE

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## PERIOPERATIVE MANAGEMENT OF RHEUMATOID ARTHRITIS PATIENTS: A REVIEW

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### ABSTRACT

Rheumatoid Arthritis (RA) is a systemic autoimmune disease characterized by chronic inflammation, joint destruction, and extra-articular manifestations, often necessitating surgical intervention for pain relief, correction of deformities, and restoration of function. This condition is further complicated by significant comorbidities, including cardiovascular disease, osteoporosis, and interstitial lung disease, which collectively elevate perioperative risks. Surgical interventions in RA patients require tailored perioperative management strategies to address these complexities, including optimizing immunosuppressive therapy, preventing infectious and thromboembolic complications, and mitigating delays in wound healing. This narrative review examines and synthesizes the current literature spanning 2008 to 2022 to provide an in-depth exploration of evidence-based approaches for perioperative management in RA patients. Key areas of focus include preoperative risk stratification, management of disease-modifying antirheumatic drugs (DMARDs) and biologics, intraoperative considerations such as anesthesia and surgical techniques, and postoperative care with a focus on infection prevention and rehabilitation. By highlighting current best practices and identifying knowledge gaps, this review aims to enhance surgical outcomes and guide future research in this complex patient population.

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## INTRODUCTION

Rheumatoid arthritis (RA) is a chronic systemic inflammatory disorder characterized by progressive joint damage, pain, and systemic manifestations, including cardiovascular, pulmonary, and renal complications. Affecting approximately 1% of the global population, RA disproportionately impacts women and leads to significant disability and reduced quality of life. The pathogenesis of RA involves a complex interplay of genetic predisposition, environmental triggers, and immune dysregulation, resulting in persistent synovial inflammation and joint destruction. Beyond joint involvement, RA is associated with systemic complications, such as vasculitis, interstitial lung disease, and heightened cardiovascular risk, all of which complicate perioperative management. Over the past two decades, advancements in RA management have markedly improved patient outcomes. Disease-modifying antirheumatic drugs (DMARDs), both conventional and biologic, have revolutionized treatment by reducing disease activity, halting progression, and preventing long-term disability. Despite these advances, surgical interventions remain necessary for many RA patients, particularly in cases of severe joint damage, refractory pain, or deformities unresponsive to medical therapy. Common procedures include joint replacements, tendon repairs, and synovectomies, with the goals of

improving function, alleviating pain, and enhancing quality of life. Perioperative management in RA patients presents unique challenges due to the interplay of disease activity, immunosuppressive therapy, and comorbid conditions. Effective management requires a multidisciplinary approach involving rheumatologists, surgeons, anesthesiologists, and rehabilitation specialists to minimize surgical risks and optimize outcomes. Key considerations include the careful modulation of immunosuppressive therapies to balance the risk of disease flares against infection, management of comorbidities such as cardiovascular and pulmonary conditions, and implementation of strategies to prevent complications such as venous thromboembolism (VTE) and delayed wound healing. This narrative review synthesizes the available literature from 2008 to 2022 to provide a comprehensive overview of perioperative strategies for RA patients undergoing surgery. By integrating current evidence and identifying gaps in knowledge, the review aims to guide clinical practice and highlight areas for future research.

## MATERIALS AND METHODS

A narrative review approach was employed to synthesize relevant literature on perioperative management in RA patients. Articles

published between 2008 and 2022 were identified through systematic searches of electronic databases, including PubMed, Scopus, and Web of Science. The following keywords were used: "rheumatoid arthritis," "perioperative management," "surgical complications," "DMARDs," "biologics," "infection," "anesthesia," and "surgical outcomes." Inclusion criteria included peer-reviewed articles, systematic reviews, randomized controlled trials, and observational studies focusing on perioperative management in RA patients. Articles were excluded if they lacked relevance to the perioperative period, were not in English, or addressed non-surgical interventions exclusively. To ensure comprehensive coverage, bibliographies of key articles were also reviewed for additional relevant studies. Data were extracted on preoperative risk assessment, management of immunosuppressive therapy, intraoperative considerations, postoperative care, and surgical outcomes. Discrepancies in evidence were noted, and gaps in research were highlighted for future investigation.

## RESULTS

### Preoperative Evaluation

**Comprehensive Risk Assessment:** Preoperative evaluation is essential for identifying modifiable risk factors and optimizing patients for surgery. A thorough history and physical examination should assess disease activity, functional status, and extra-articular manifestations. Functional limitations, such as restricted range of motion, fatigue, and reduced physical endurance, should be documented. Inflammatory markers, including C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR), can provide insight into systemic inflammation. Identifying high-risk features such as history of infections, poor nutritional status, or uncontrolled comorbidities enables targeted preoperative interventions.

**Laboratory and Imaging Studies:** Laboratory tests, including renal and hepatic function panels, are critical to evaluate potential drug toxicities and comorbid conditions. Testing for anemia, electrolyte imbalances, and coagulation abnormalities is also necessary, as these factors may influence surgical planning and perioperative risk. Cervical spine imaging, particularly radiographs or MRI, is crucial for detecting atlantoaxial subluxation, a potentially life-threatening complication during intubation. Pulmonary imaging and function tests are indicated for patients with respiratory symptoms or a history of interstitial lung disease, as compromised pulmonary reserve increases the risk of perioperative complications. Advanced imaging techniques, such as high-resolution CT scans or echocardiography, may further guide the evaluation of organ-specific involvement.

**Cardiovascular Risk Assessment:** RA patients have a heightened risk of cardiovascular disease (CVD) due to systemic inflammation and associated comorbidities. Preoperative risk stratification should include assessment of ischemic heart disease, arrhythmias, and heart failure. Tools such as echocardiography, stress testing, and coronary calcium scoring may be warranted for high-risk individuals. Optimizing cardiovascular status through medication adjustments, smoking cessation, and glycemic control is essential to minimize perioperative complications. Patients with a history of cerebrovascular events or peripheral arterial disease may benefit from specialized consultation and tailored management plans.

### Management of Immunosuppressive Therapy

**Glucocorticoids:** Patients on long-term glucocorticoids are at increased risk for adrenal insufficiency, infections, and poor wound healing. Perioperative glucocorticoid management involves maintaining sufficient coverage to prevent adrenal crisis while minimizing immunosuppressive effects. Typical regimens include stress-dose corticosteroids tailored to the patient's baseline requirements. Close monitoring for hyperglycemia and electrolyte imbalances during the perioperative period is essential to mitigate secondary complications.

**DMARDs and Biologics:** Methotrexate has been shown to reduce perioperative complications when continued during surgery, and its discontinuation may lead to disease flares. Conversely, biologics, including tumor necrosis factor inhibitors, are commonly withheld preoperatively to reduce infection risk. The timing of discontinuation should be individualized based on the half-life of the specific agent. Emerging therapies such as JAK inhibitors present new challenges in perioperative management, and further research is needed to establish clear guidelines. Balancing the risks of disease flare against potential infections remains a key concern when managing immunosuppressive therapies.

### Intraoperative Considerations

**Anesthetic Management:** Cervical spine instability necessitates careful airway management to prevent spinal cord injury during intubation. Preoperative imaging should be thoroughly reviewed to guide anesthetic planning. Regional anesthesia may be preferable in patients with severe pulmonary or cardiac compromise, as it minimizes the risks associated with general anesthesia. Collaboration between anesthesiologists and surgeons is essential to address unique challenges in RA patients, including positioning to protect vulnerable joints and avoiding prolonged immobilization.

**Surgical Techniques:** Minimally invasive surgical techniques, such as arthroscopy, may reduce tissue trauma, lower infection rates, and expedite recovery. Enhanced recovery protocols (ERPs), emphasizing multimodal analgesia, early mobilization, and optimized nutrition, have demonstrated success in improving postoperative outcomes. Surgeons must remain vigilant about meticulous aseptic techniques to prevent surgical site infections (SSIs). Preoperative optimization, such as improving nutritional status and stabilizing comorbid conditions, enhances the likelihood of favorable surgical outcomes.

### Postoperative Care

**Infection Prevention:** Perioperative antibiotic prophylaxis is critical for reducing SSIs. Administering antibiotics within the appropriate time frame before incision and adhering to protocolized dosing regimens are essential components of infection prevention. Stringent aseptic techniques, early mobilization, and monitoring for signs of infection, such as wound erythema or drainage, are crucial to minimize risks. Immunosuppressive agents should be reintroduced postoperatively with caution to balance infection prevention and disease control. Routine follow-up and patient education regarding wound care can further reduce infection risks.

**Pain Management and Rehabilitation:** Multimodal analgesia, including regional anesthesia and non-opioid analgesics, is recommended to enhance postoperative recovery. Integrating physical therapy into the early postoperative period is essential for restoring joint mobility, preventing stiffness, and optimizing functional outcomes. RA patients may require tailored rehabilitation programs to address pre-existing functional limitations and joint deformities. Addressing barriers to effective rehabilitation, such as fatigue and limited access to care, can significantly influence recovery trajectories and long-term outcomes.

## DISCUSSION

Perioperative management in RA patients requires an individualized and multifaceted approach to address the complexities of systemic disease, immunosuppressive therapy, and comorbidities. Effective management hinges on a thorough understanding of the interplay between RA pathophysiology, surgical stress, and patient-specific factors. This review underscores the pivotal role of preoperative optimization, which includes the identification and management of modifiable risk factors such as active disease, malnutrition, and poorly controlled comorbidities. Collaborative decision-making between rheumatologists, surgeons, and anesthesiologists is essential to tailor perioperative plans to individual patient needs. Advances in

surgical techniques and perioperative care have significantly reduced complications and improved outcomes in RA patients. Enhanced recovery protocols (ERPs), which integrate multimodal analgesia, early mobilization, and patient education, have been shown to accelerate functional recovery and reduce hospital stays. However, the application of these protocols in RA patients requires further adaptation to account for the unique challenges posed by chronic inflammation and immunosuppressive therapy. Management of immunosuppressive therapy remains a cornerstone of perioperative care in RA patients. Evidence supports the continuation of methotrexate during the perioperative period to prevent disease flares, while biologics are generally withheld preoperatively to mitigate infection risks. Despite these guidelines, there is variability in clinical practice, highlighting the need for standardized protocols informed by robust clinical trials. The timing of biologic reintroduction postoperatively is another area that warrants further investigation to balance infection prevention with disease control. The prevention of postoperative complications, such as infections and thromboembolic events, is a critical aspect of perioperative care. Stringent aseptic techniques, perioperative antibiotic prophylaxis, and appropriate thromboprophylaxis are essential components of risk mitigation. Additionally, the role of emerging therapies, such as JAK inhibitors, in the perioperative setting remains unclear and requires further exploration. Future research should focus on addressing gaps in knowledge, including the optimal perioperative management of emerging therapies, the long-term impact of surgical interventions on disease progression, and the role of patient-reported outcomes in guiding care. Efforts to reduce disparities in access to surgical care and improve outcomes in underserved populations are also of paramount importance. Finally, the integration of precision medicine approaches, leveraging biomarkers and advanced imaging, may offer new avenues for personalizing perioperative care in RA patients.

## CONCLUSION

Effective perioperative management in RA patients undergoing surgery necessitates comprehensive planning, multidisciplinary collaboration, and adherence to evidence-based practices. By addressing modifiable risk factors, optimizing medical therapy, and implementing targeted interventions, healthcare providers can improve surgical outcomes and quality of life for RA patients. Continued research is essential to refine perioperative strategies and address unanswered questions in this complex patient population.

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