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PREOPERATIVE PREPARATION AND PREVENTION OF COMPLICATIONS IN SURGICAL PATIENTS

Introduction

The preoperative period is a critical phase in surgical care, aimed at optimizing patient outcomes and minimizing complications. Globally, over 300 million surgeries are performed annually, yet postoperative complications occur in 10–15% of cases, with mortality rates reaching 1–4% in high-income countries. Effective preoperative preparation, including risk assessment, patient optimization, and preventive measures, significantly reduces adverse events such as infections, bleeding, and organ dysfunction. Poorly managed preoperative care contributes to prolonged hospital stays and increased healthcare costs, particularly in patients with comorbidities like diabetes or cardiovascular disease, which affect 20–30% of surgical candidates. Evidence suggests that standardized protocols and interdisciplinary approaches enhance safety, yet gaps in implementation persist. This study explores preoperative strategies to address these challenges and improve surgical success rates, emphasizing practical interventions supported by clinical data.

Goal

To evaluate preoperative preparation methods, identify strategies for preventing complications, and assess their impact on surgical outcomes based on current evidence.

Material and methods of research

This study reviews literature from PubMed, Elsevier, and Cochrane Library, focusing on preoperative protocols and complication prevention. Data synthesis and comparative analysis were used to assess findings from clinical trials and observational studies published between 2015 and 2025.

The results of research and their discussion

Preoperative preparation encompasses risk stratification, patient optimization, and complication prophylaxis, each contributing to surgical safety. Risk assessment tools, such as the American Society of Anesthesiologists (ASA) classification, identify high-risk patients, with 25% of ASA III–IV individuals experiencing complications compared to 5% in ASA I–II. Cardiac evaluation, recommended for 15% of patients over 60 years, reduces perioperative

myocardial infarction rates from 3.1% to 1.2% when optimized with beta-blockers or statins. Nutritional screening is critical, as malnutrition, present in 15–40% of surgical candidates, doubles infection risk; preoperative carbohydrate loading decreases postoperative insulin resistance by 50% in abdominal surgeries. Smoking cessation, advised 4–8 weeks prior, lowers wound infection rates from 12% to 5%, while alcohol abstinence reduces delirium incidence by 30% in heavy drinkers.

Infection prevention relies on antibiotic prophylaxis and skin preparation. Single-dose antibiotics, administered within 60 minutes of incision, reduce surgical site infections (SSIs) from 8.7% to 2.3% in clean-contaminated procedures. Chlorhexidine-alcohol skin prep outperforms povidone-iodine, cutting SSI rates by 41% in a study of 849 patients. Hair removal, when necessary, should use clippers rather than razors to avoid a 2.5 – fold increase in infection risk. Blood glucose control, targeting levels below 200 mg/dL, halves SSI incidence in diabetics, who comprise 10% of surgical patients.

Thromboembolism prophylaxis is vital, with venous thromboembolism (VTE) affecting 1–5% of untreated patients. Low-molecular-weight heparin, initiated preoperatively, reduces VTE rates by 70% in orthopedic cases, while mechanical methods like compression stockings lower risk by 50% in general surgery. Anemia correction, affecting 30% of elective surgery patients, improves outcomes; preoperative iron therapy decreases transfusion needs from 15% to 7%. Psychological preparation, though less studied, mitigates anxiety in 60% of patients, potentially reducing postoperative pain scores by 20%.

Standardized checklists, implemented in 80% of high-performing centers, ensure compliance with these measures, decreasing complication rates by 30% in a cohort of 3,733 patients. Delayed optimization, however, increases emergency conversions by 15%, highlighting the need for timely intervention. Multidisciplinary collaboration, involving surgeons, anesthesiologists, and nurses, enhances adherence to protocols, particularly in complex cases where comorbidities elevate risk by 25%. Tailored approaches, adjusted for age, procedure type, and patient history, optimize efficacy, though resource constraints in low-income settings limit widespread adoption.

Conclusion

Effective preoperative preparation significantly reduces surgical complications through risk assessment, patient optimization, and targeted prophylaxis. Strategies like cardiac optimization, infection control, and thromboembolism prevention, supported by standardized protocols, improve outcomes, with complication rates dropping by up to 30% in optimized patients. Individualized care, addressing comorbidities and lifestyle factors, is essential for success, though implementation varies by setting.

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