INTRODUCTION
Tobacco use has been extensively studied as a risk factor for postoperative complications in orthopaedic surgery. While the effects of smoking tobacco and nicotine are well established, the impact of smokeless tobacco (ST) remains relatively poorly understood. Despite the common perception that ST is a safer alternative to smoking, ST delivers prolonged systemic nicotine exposure at comparable levels. Therefore, we investigated the association between ST and postoperative outcomes in orthopaedic procedures.

METHODS
A narrative review of the literature was conducted, focusing on studies examining nicotine exposure, ST use, and postoperative outcomes in orthopaedic surgery. Studies assessing complications across multiple procedures were reviewed, and outcomes of interest included postoperative medical complications and joint-related complications.

RESULTS
The majority of studies found that ST use had higher odds of medical complications compared with nonusers and smokers across multiple orthopaedic procedures (Table 1). No significant association was observed between ST use and joint-related complications in shoulder procedures. Despite higher odds of joint-related complications among ST users across lower extremity procedures compared to nonusers, smokers demonstrated worse outcomes than ST users in all procedures except ACL reconstruction. Preoperative smoking cessation reduced complications in total shoulder arthroplasty and rotator cuff repairs but not in cervical and lumbar fusions.

CONCLUSION
Our findings support current literature on nicotine's contribution to postoperative complications and challenge the perception that ST is a safer alternative. Smoking cessation therapy proved beneficial in shoulder procedures but ineffective in vertebral fusions, however the efficacy of ST cessation therapy on orthopaedic outcomes remains underexplored and serves as an area of future research. Despite nicotine's broad association with worsened outcomes, it has demonstrated therapeutic effects in smokers undergoing cervical fusion, introducing potential novel clinical applications. Addressing gaps in patient education and provider protocols for surgical eligibility can optimize outcomes in tobacco users.

Table 1. Complications in Smokeless Tobacco (ST) Users Across Orthopaedic Procedures.

Author	Procedure	ST Odds Ratio Complication Comparisons
Vanderham, 2025[57]	Total Shoulder Arthroplasty	Higher cardiac issues, sepsis, acute respiratory distress syndrome, and 180d post-op mortality compared to nonusers
Khnanisho, 2026[10]	Rotator Cuff Repair	Higher acute kidney injury, pneumonia, myocardial infarction, infections, and ER visits compared to nonusers and smokers
Waters, 2023[58]	Scaphoid Fracture (nonsurgical management)	Higher nonunion rates vs nonusers with similar outcomes to smokers
Cole, 2023[56]	Lumbar Fusion	Higher pseudoarthritis, revision surgeries, and spinal complications compared to nonusers, lower pseudoarthrosis and infection compared to smokers
Waters, 2023[59]	Total Hip Arthroplasty	Increased wound disruption, deep vein thrombosis, cardiac arrest, periprosthetic fracture, and joint dislocation compared to nonusers Decreased loosening or mechanical failure compared to smokers
Holle, 2025[59]	ACL Reconstruction	Increased reoperation rates and meniscus surgery within 2 yrs post-op, pneumonia, and acute kidney injury compared to nonusers and smokers
Waters, 2023[24]	Total Knee Arthroplasty	Higher aseptic loosening and mechanical failure within 2 yrs post-op, and pneumonia, DVT, acute kidney injury, longer length stay within 90d post-op compared to nonusers Lower wound disruption 90d and aseptic revision 2 yrs post-op compared to smokers

Winter, 2024[60]	Ankle and Hindfoot Arthrodesis	Increased hardware removal and wound disruption 1-2 yrs post-op compared to nonusers Decreased malunion/union within 90d post-op in ST compared to smokers