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Should Smoking Cessation Be Recommended and Required for Patients Undergoing Elective Knee or Hip Arthroplasty?

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Should smoking cessation be recommended and required for patients undergoing elective knee or hip arthroplasty?

Response/Recommendation: The literature reveals that active smokers are at an increased risk of both medical and surgical complications. Smoking cessation should be recommended and required for active smokers before elective knee or hip arthroplasty.

Level of Evidence: High.

Expert Vote: Agree: 92.8%, Disagree: 5.3%, and Abstain: 1.9%.

Rationale

The World Health Organization considers smoking, including cigarettes and other forms of tobacco, to be one of the notable risk factors that can adversely affect surgical outcomes [1]. Several articles have published findings on the correlation between smoking and an increased risk of postoperative adverse events, including

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impaired wound healing, slower recovery, and other medical complications in patients undergoing elective knee and hip arthroplasty.

The inclusion criteria for this review encompassed English-language original articles including both prospective and retrospective studies on patients who underwent primary total knee or hip arthroplasty and reported the correlation between smoking (cigarettes, tobacco, or nicotine-containing substitutes) and post-operative complications. No minimum smoking amount was set. A comprehensive search was conducted on PubMed, Scopus, and the CINAHL database, resulting in 1,093 abstracts. After screening, 40 manuscripts with a total number of 1,036,654 patients were included in the final review, with the two largest studies involving 317,230 and 272,640 patients [2,3]. Current active smokers

increased the odds of overall mortality compared to patients who were former smokers and quit smoking before surgery [odds ratio (OR) 2.34; 95% confidence interval (CI) 1.98 to 2.77], and increased the odds of readmission compared to patients who never smoked (OR 1.46; 95% CI 1.34 to 1.59).

For medical complications, current smokers increased the odds of respiratory adverse events, including respiratory insufficiency and pneumonia, when compared to nonsmokers and former smokers (OR 2.27; 95% CI 2.09 to 2.47 for nonsmokers and OR 1.47; 95% CI 1.23 to 1.77 for former smokers). Similarly, smoking patients had an increased odds of cardiovascular events, including myocardial infarction (OR 2.85; 95% CI 2.49 to 3.26) and venous thromboembolism (OR 2.82; 95% CI 2.45 to 3.23). In addition to pulmonary and cardiovascular adverse events, a higher incidence of postoperative delirium was observed in current smokers who underwent total knee arthroplasty [4]. For surgical complications, the odds of overall surgical failure and needing revision surgery in current smokers were 1.31 (95% CI 1.23 to 1.40). Smoking patients were associated with an increased odds of 1.65 (95% CI 1.55 to 1.76) in surgical site infections, including deep wound infections and periprosthetic joint infections. These patients also increased the risks of aseptic loosening (OR 1.20; 95% CI 1.03 to 1.40) and periprosthetic fracture (OR 3.20; 95% CI 2.56 to 4.00).

Additionally, functional outcomes were found to be poorer in current smoking patients. Halawi et al. [5] demonstrated that smokers achieved significantly lower improvements in the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Short Form-12 Physical Composite Summary (SF-12 PCS) compared to nonsmokers at 6 and 12 months postoperatively. For each unit increase in packs per day smoked, WOMAC scores increased (clinically worsened) by 7.7 points and SF-12 PCS decreased by 4.8 points. Smokeless tobacco is also associated with an increased risk of medical-related and surgical-related complications within 90 days and up to 2 years after surgery [6]. A survey of smokers who asked to quit smoking before surgery revealed that 62% of them quit smoking for an average of 45 days before surgery. However, by 6 months postoperatively, 49% of these former smokers had resumed smoking [7]. Not only did smoking negatively affect outcomes after total knee and hip arthroplasty but patients who did not smoke but were exposed to smoking in the family or workplace were also impacted. These passive smokers experienced more postoperative pain, lower functional outcomes, aggravated depression and anxiety, and a deteriorated quality of life [8].

The American Academy of Orthopaedic Surgeons recommends smoking cessation at least 4 to 6 weeks before elective surgical procedures and at least 6 weeks following surgery [9]. Møller et al. found that patients who received a smoking cessation program with counseling and nicotine replacement therapy for 6 to 8 weeks

before surgery significantly reduced wound-related complications, cardiovascular complications, and the need for revision surgery [10].

CRediT authorship contribution statement

Atthakorn Jarusriwanna: Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Plamen Kinov:** Writing – review & editing, Data curation, Conceptualization. **Simon Kovač:** Writing – review & editing, Data curation, Conceptualization. **Satish Kutty:** Writing – review & editing, Data curation, Conceptualization. **Richard Kyte:** Writing – review & editing, Data curation, Conceptualization. **Arjun Lamichhane:** Writing – review & editing, Data curation, Conceptualization. **Minjae Lee:** Writing – review & editing, Data curation, Conceptualization.

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