AAHKS Patient Education Committee

A Successful Hip or Knee Surgery Depends on You Quitting Smoking

"Doctor, I'm ready to have my knee replacement surgery, but I'm a smoker. Is it safe for me to continue smoking and have my surgery?"

Joint replacement surgeons often hear this question in their offices. **Quitting smoking is one of the most critical things to do in preparation for hip or knee replacement surgery so that your surgery will be successful.** It is well known that the effects of nicotine on the body directly cause chronic obstructive pulmonary disease, lung cancer, vascular disease, hypertension, coronary artery disease and blood clots - just to name a few. You may not know that smoking and using nicotine products can negatively impact your upcoming hip or knee replacement surgery and how well you do after surgery.

The widespread health impacts of nicotine and tobacco products can increase your risk of a complication in the period of time around surgery. **Toxins in cigarette smoke affect the body's inflammatory response which in turn affect the body's ability to heal.** This can lead to weak scar tissue and increased risk of problems with the wound. Studies have shown that active cigarette smokers have up to 1.5 to 3.2 times increased risk of wound-related complications following a joint replacement surgery. The carbon monoxide and nicotine gas in tobacco smoke reduces the ability of blood to carry oxygen to tissues effectively. The toxins in cigarette smoke also alter the body's immune system by slowing the white blood cells' ability to respond to infections. Ultimately, the poor scar formation, wound problems, poor oxygen delivery, and poor immune response from smoking have the combined effect of greatly increasing your risk of developing a prosthetic joint infection by up to 1.8 times. **Infection after joint replacement surgery can be a devastating complication**, and every effort should be made to prevent these complications.

Many published articles have shown that active smokers take longer to recover and stay longer in the hospital following hip and knee replacement surgeries. In addition, smokers have increased rates of being readmitted to the hospital for complications after surgery. Tobacco smokers have been found to have poor pain control after joint replacement surgery, and compared to nonsmokers, they require significantly greater doses of narcotic pain medications like opioids.

Although smoking can have these devastating complications, the good news is that **quitting smoking and avoiding nicotine products can improve your chances of having a successful surgery**. If you quit smoking for four to six weeks prior to surgery and continue for four weeks after, studies show that you can reduce your risk of complications by up to 50%. The longer you stay away from smoking and nicotine, the greater the benefit.

If you are considering joint replacement surgery, speak to your doctor about quitting smoking prior to your surgery to better your chances of having a safe surgery with great outcomes. There are many ways to do this including counseling, referrals to local smoking cessation programs, nicotine replacement therapy and even quitting "cold turkey." Your doctor can help you plan the right approach that's best for you.

The following is a summary of a recent study on the topic of smoking and complications after joint replacement surgery.

Tobacco Use and Risk of Wound Complications and Periprosthetic Joint Infection: A Systematic Review and Meta-Analysis of Primary Total Joint Arthroplasty Procedures.

This purpose of this study was to conduct a large-scale analysis of all the literature available to assess the association between tobacco use and the risk of any wound complication and periprosthetic joint infection after primary total hip and total knee arthroplasty procedures. Fourteen separate studies on the topic were included in the analysis. The data found tobacco users to have significantly higher risk of wound complications (1.78 increased odds) and periprosthetic joint infections (2.16 increased odds) compared to non-tobacco users. The study also found current tobacco users to have significantly increased risk of periprosthetic joint infections (1.52 increased odds) compared to former tobacco users.

Bedard NA, DeMik DE, Owens JM, Glass NA, DeBerg J, Callaghan JJ. J Arthroplasty. 2019 Feb;34(2):385-396.e4. doi: 10.1016/j.arth.2018.09.089. Epub 2018 Oct 9.

Here are other studies that looked at smoking and joint replacement surgery:

1. Duchman KR, Gao Y, Pugely AJ, et al. The effect of smoking on short-term complications following total hip and knee arthroplasty. J Bone Joint Surg Am. 2015;97:1049-58.

2. Tischler EH, Matsen Ko L, Chen AF, et al. Smoking increases the rate of reoperation for infection within 90 days after primary total joint arthroplasty. J Bone Joint Surg Series A. 2017;99:295-304.

3. Hoff CM, Grau C, Overgaard J. Effect of smoking on oxygen delivery and outcome in patients treated with radiotherapy for head and neck squamous cell carcinoma—a prospective study. Radiother Oncol: Journal Eur Soc Therapeutic Radiology Oncol. 2012;103:38-44.

4. Brugger OE, Frei M, Sendi P, et al. Assessment of smoking behaviour in a dental setting: a 1-year follow-up study using self-reported questionnaire data and exhaled carbon monoxide levels. Clinical Oral Investigations. 2014;18: 909-15.

5. Sorensen LT. Wound healing and infection in surgery: the pathophysiological impact of smoking, smoking cessation, and nicotine replacement therapy: a systematic review. Ann Surg. 2012;255:1069-79.

6. Moller AM, Pedersen T, Villebro N, et al. Effect of smoking on early complications after elective orthopaedic surgery. J Bone Joint Surg Br. 2003;85:178-81. c11.indd 83 23-05-2018 10:06:59 84 Periprosthetic Joint Infection: Updated Practical Management Guide

7. Kunutsor SK, Whitehouse MR, Blom AW, et al. Patientrelated risk factors for periprosthetic joint infection after total joint arthroplasty: a systematic review and meta-analysis. PLoS One. 2016;11:e0150866.

8. Teng S, Yi C, Krettek C, et al. Smoking and risk of prosthesis-related complications after total hip arthroplasty: a meta-analysis of cohort studies. PLoS One. 2015;10: e0125294.

9. Otero JE, Gholson JJ, Pugely AJ, et al. Length of hospitalization after joint arthroplasty: does early discharge affect complications and readmission rates? J Arthroplasty. 2016; 31:2714-25.

10. Lindstrom D, Sadr Azodi O, Wladis A, et al. Effects of a perioperative smoking cessation intervention on postoperative complications: a randomized trial. Ann Surg. 2008;248:739-45.

11. Etcheson JI, Gwam CU, Delanois RE et al. Opiate Pain Medication Consumption in Cigarette Smokers following Total Hip Arthroplasty. Joints. 2018; 6(3):157-160.

12. Bedard NA, DeMik DE, Callaghan JJ et al. Tobacco Use and Risk of Wound Complications and Periprosthetic Joint Infection: A Systematic Review and Meta-Analysis of Primary Total Joint Arthroplasty Procedures.J Arthroplasty. 2019;34(2):385-396.

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This article has been written and peer reviewed by the AAHKS Patient and Public Relations Committee and the AAHKS Evidence Based Medicine Committee. Links to these pages or content used from the articles must be given proper citation to the American Association of Hip and Knee Surgeons.

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