# Colectomy Outcomes in Smokers versus Nonsmokers in a Veteran Population

Sarah Haviland MD[1], Suzanne Arnott MD[2], Matthew Ng MD[3], James Duncan MD[4], Vincent Obias MD[3]

[1] Walter Reed National Military Medical Center, Bethesda, MD; [2] Department of Surgery, George Washington University Hospital, Washington, DC; [3] Department of Colorectal Surgery at the George Washington University Hospital, Washington, DC; [4] Department of Surgery, VA Medical Center, Washington, DC.

## Objective:

- Tobacco use is known to be higher in the military and veteran populations compared to the general civilian population.
- The goal of this study is to examine the effect of smoking on outcomes after colectomy in veterans.

## Methods:

- The Veterans Affairs Surgical Quality Improvement Program (VASQIP) database was queried for colectomies performed between 2000 and 2019.
- Patients with ascites, ASA class V, disseminated cancer, pre-operative sepsis, pre-operative coma, ventilator dependence, and emergent cases were excluded.
- Patient demographics and outcomes were compared between smokers and nonsmokers.

## Results:

- After exclusions, 35,333 patients were identified (10,542 smokers and 24,791 nonsmokers).
- Compared to nonsmokers, the smokers were more likely to be younger, have lower BMI, be black, have dyspnea, COPD, drink >2 drinks/day of alcohol, have undergone radiation therapy, and have independent functional status.
- Nonsmokers were more likely to be male, have diabetes, CHF, hypertension, bleeding disorder, chronic steroid use, and require dialysis before surgery.

**Figure 1: Post-operative Outcomes**

| Variable | Nonsmoker (n=24791, 70.2%) | Smoker (n=10542, 29.8%) | P value |
|---|---|---|---|
| 30-day Mortality | 377 (1.5%) | 138 (1.3%) | .129 |
| Return to OR within 30 days | 1794 (7.2%) | 972 (9.2%) | **<.001** |
| Cardiac arrest | 203 (0.8%) | 73 (0.7%) | .217 |
| MI | 138 (0.6%) | 44 (0.4%) | .094 |
| CVA/Stroke | 59 (0.2%) | 16 (0.2%) | .107 |
| Bleeding requiring >4 units pRBCs | 86 (0.3%) | 50 (0.5%) | .077 |
| DVT/Thrombophlebitis | 216 (0.9%) | 56 (0.5%) | **<.001** |
| Systemic sepsis | 934 (3.8%) | 470 (4.5%) | **.002** |
| Failure to wean from ventilator >48hrs | 515 (2.1%) | 291 (2.8%) | **<.001** |
| Pneumonia | 586 (2.4%) | 364 (3.5%) | **<.001** |
| Pulmonary embolism | 198 (0.8%) | 45 (0.4%) | **<.001** |
| Reintubation | 570 (2.3%) | 333 (3.2%) | **<.001** |
| Acute renal failure | 145 (0.6%) | 54 (0.5%) | .404 |
| UTI | 721 (2.9%) | 252 (2.4%) | **.006** |
| Wound dehiscence | 471 (1.9%) | 326 (3.1%) | **<.001** |
| Organ/Space SSI | 703 (2.9%) | 378 (3.7%) | **<.001** |
| Superficial SSI | 1567 (6.3%) | 813 (7.7%) | **<.001** |
| Deep wound SSI | 339 (1.4%) | 186 (1.8%) | **.005** |
| Wound classification | | | **<.001** |
| 1 | 986 (4.0%) | 375 (3.6%) | |
| 2 | 21107 (85.1%) | 8843 (83.9%) | |
| 3 | 2140 (8.6%) | 936 (8.9%) | |
| 4 | 558 (2.3%) | 388 (3.7%) | |
| Mean operative time (hrs.min) | 3.225 | 3.186 | **.032** |
| Mean post-op hospital length of stay (days) | 8.51 | 8.71 | .057 |

## Results continued:

- Smokers had shorter mean operative time and were more likely to have wound class 3 or 4. Smokers also had higher rates of return to the OR within 30 days, post-operative sepsis, failure to wean off the ventilator within 48 hours after surgery, post-operative pneumonia, wound dehiscence, deep and superficial surgical site infections, and require reintubation.
- Nonsmokers had higher rates of DVTs, pulmonary emboli, and urinary tract infections.
- There was no significant difference in post-operative hospital length of stay, 30-day all-cause mortality, cardiac arrest requiring CPR, MI, CVA/stroke, significant post-operative bleeding, or acute renal failure.
- In a multivariate regression model, higher ASA class (OR 2.319, p<.001), concurrent pneumonia (OR=3.128, p=.009), pre-operative weight loss (OR=1.954, p<.001), increased age (OR=1.066, p<.001), bleeding disorder (OR=2.399, p<.001), COPD (OR=1.304, p=.023), dyspnea (OR=1.709, p<.001), dependent functional status (OR=3.503, p<.001), wound class 3/4 (OR=1.411, p=.007), and smoking (OR=1.374, p=.007) were independent predictors for increased risk of death.

## Conclusions:

- Despite being younger with fewer comorbidities, smokers undergoing colectomy had higher rates of post-operative pulmonary complications, sepsis, and wound complications than nonsmokers. However, there was no difference in all-cause 30-day mortality.