**Supplemental Table S5**

**Adjusted relative hazard of ceasing opioid utilization among geriatric patients undergoing spinal surgery for degenerative spine disease-related diagnoses – sensitivity analysis using pre-operative total milligram morphine equivalents**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Hazard Ratio** | **95% Confidence Interval** |
| Surgery (Days 1-179 Post-Op)1 |  |  |
| ACDF | Reference | Reference |
| PCF | 0.93 | 0.83 – 1.03 |
| 360o Cervical Fusion | 0.88 | 0.70 – 1.09 |
| Lumbar Microdiscectomy | 0.97 | 0.91 – 1.04 |
| Lumbar Laminectomy | 0.98 | 0.91 – 1.05 |
| Lumbar Fusion, Posterior Approach | 0.79 | 0.74 – 0.84 |
| Lumbar Fusion, Anterior Approach | 0.76 | 0.61 – 0.94 |
| 360o Lumbar Fusion | 0.68 | 0.61 – 0.75 |
| Surgery (Days 180-365 Post-Op)1 |  |  |
| ACDF | Reference | Reference |
| PCF | 1.42 | 0.64 – 3.14 |
| 360o Cervical Fusion | 1.56 | 0.37 – 6.56 |
| Lumbar Microdiscectomy | 0.99 | 0.60 – 1.64 |
| Lumbar Laminectomy | 1.31 | 0.78 – 2.21 |
| Lumbar Fusion, Posterior Approach | 1.46 | 0.96 – 2.23 |
| Lumbar Fusion, Anterior Approach | 0.78 | 0.18 – 3.27 |
| 360o Lumbar Fusion | 1.41 | 0.78 – 2.55 |
| Sex |  |  |
| Male | Reference | Reference |
| Female | 0.94 | 0.91 – 0.98 |
| Race |  |  |
| White | Reference | Reference |
| Black | 1.08 | 0.97 – 1.19 |
| Asian | 1.18 | 1.004 – 1.39 |
| Hispanic | 1.12 | 0.92 – 1.36 |
| American Indian/Alaska Native | 1.08 | 0.79 – 1.48 |
| Other | 1.15 | 0.96 – 1.37 |
| Unknown | 1.24 | 0.90 – 1.71 |
| Age Group |  |  |
| <70 | Reference | Reference |
| 70-74 | 1.04 | 1.00 – 1.09 |
| 75-79 | 1.14 | 1.09 – 1.20 |
| 80+ | 1.30 | 1.23 – 1.37 |
| Region |  |  |
| WE | Reference | Reference |
| MW | 1.02 | 0.97 – 1.08 |
| NE | 1.06 | 0.99 – 1.12 |
| SO | 0.98 | 0.93 – 1.03 |
| Surgeon Specialty |  |  |
| Neurosurgery | Reference | Reference |
| Other | 1.02 | 0.99 – 1.06 |
| Charlson Comorbidity Index |  |  |
| 0 | Reference | Reference |
| 1 | 1.01 | 0.97 – 1.05 |
| 2 | 0.99 | 0.94 – 1.05 |
| 3+ | 1.03 | 0.98 – 1.09 |
| Benzodiazepine Use2 | 0.94 | 0.89 – 1.00 |
| Alcohol Abuse2 | 0.93 | 0.77 – 1.13 |
| Drug Abuse2 | 1.06 | 0.91 – 1.23 |
| Anxiety2 | 0.91 | 0.86 – 0.95 |
| Depression2 | 1.01 | 0.96 – 1.06 |
| History of Cancer2 | 0.94 | 0.87 – 1.03 |
| Active cancer treatment before surgery2 | 1.05 | 0.94 – 1.17 |
| Active cancer treatment after surgery3 | 0.95 | 0.84 – 1.08 |
| Medicaid eligible at surgery | 0.89 | 0.83 – 0.97 |
| Total Preoperative Opioid Use in Milligram Morphine Equivalents4 |  |  |
| No Use | Reference | Reference |
| 1 – <2,500 | 0.77 | 0.74 – 0.81 |
| 2,500 - <4,500 | 0.49 | 0.46 – 0.52 |
| 4,500 - <9,000 | 0.30 | 0.28 – 0.33 |
| 9,000 - <18,250 | 0.21 | 0.19 – 0.24 |
| >18,250 | 0.17 | 0.15 – 0.20 |
| Procedure Year |  |  |
| 2008 | Reference | Reference |
| 2009 | 1.02 | 0.94 – 1.10 |
| 2010 | 1.01 | 0.94 – 1.09 |
| 2011 | 0.97 | 0.90 – 1.04 |
| 2012 | 0.94 | 0.88 – 1.01 |
| 2013 | 1.02 | 0.95 – 1.09 |
| 2014 | 0.97 | 0.91 – 1.04 |
| Urban/Rural |  |  |
| Rural | Reference | Reference |
| Metro | 1.03 | 0.94 – 1.14 |
| Urban, Non-metro | 0.98 | 0.89 – 1.09 |

1All hazards ratios were calculated over the at-risk period, which was defined as one year post-operatively for this study except in the case of surgery type because it did not meet the proportional hazards assumption when the at-risk period was considered the year following surgery.

2Measured in the 12 months prior to surgery

3Measured in the 12 months following surgery

4Measured in days 5-365 prior to surgery

*ACDF, anterior cervical discectomy and fusion; PCF, posterior cervical fusion*