**Supplement 1:** Coarsened Exact Matched Analysis- variables which were coarsened prior to the Coarsened Exact Matched process as per defined methods

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| **Variable Name** | **Original Variable** | **Coarsened variable** |
| Age | Linear | 3 level categorical (<=40, 41-65, >65) |
| Surgical Canadian Classification of Interventions codes | Full CCI code, categorical | 4 level categorical (total/partial arthroplasty, arthroscopic shoulder surgery, open shoulder surgery, other shoulder repair)  |
| Resource Utility Band | 6 level categorical (0 to 5) | 3 level categorical (0-2, 3, 4-5) |
| Johns Hopkins Adjusted Clinical Groups Score | Linear | 5 level categorical (quintile) |
| Neighborhood income | 5-level categorical variable (quintiles) | 3 level categorical (terciles) |

All other variables that had been included in the original model were also included in the match (exact hospital, preoperative opioid use (naïve, exposed or tolerant), sex (binary), rurality (binary), year of surgery (6-level categorical), neighborhood income quintile (5-level categorical variable), previous acute hospitalizations (binary), previous Emergency department visits (binary) and each Elixhauser comorbidity (binary)). As we had conducted coarsening, post-match adjustment was done for age, surgical Canadian Classification of Interventions codes and Johns Hopkins Adjusted Clinical Groups Score (ACG) code as these three variables were substantially coarsened for the match.