**Supplement Table 1. Codes lists for osteoarthritis, myocardial infarction, tramadol, naproxen, diclofenac and codeine**

|  |  |
| --- | --- |
| Osteoarthritis (Read code) | N05z711,7P20400,N05z211,N050600,N05z411,N05z712,N050.00,N050z00,N050200,N050100,N050000,N053512,N05z511,N05z611,N053.00,N053z00,N053800,N053100,N053700,N053300,N053400,N053600,N053200,N053000,N053500,N051.00,N051z00,N051F00,N051800,N051700,N051300,N051400,N051600,N051500,N051100,N051200,N051D00,N051E00,N051000,N052.00,N052z00,N052800,N052500,N052700,N052300,N052400,N052600,N052100,N052200,N052000,N054000,N054.00,N054900,N054700,N054300,N054400,N054600,N054500,N054100,N054800,N05..11,N05..00,N110.12,N05z.00,N05zz00,N05zS00,N05zB00,N05zN00,N05z700,N05zH00,N05zD00,N05zC00,N05zJ00,N05zU00,N05zL00,N05zT00,N05zF00,N05zR00,N05zG00,N05zK00,N05z900,N05z100,N05zA00,N05zP00,N05zQ00,N05z300,N05z400,N05z600,N05z200,N05zM00,N05z000,N05zE00,N05z800,N05z500,N11D000,N11D200,N054z00,N051G00,N11..12,N11D.00,N11D300,N11D100,N11z.11,N053611,N050400,N05z412,N05z713,N05z311,N051900,N051A00,N051B00,N051C00,N053511,N053900,N05z.11, NyuC700,N312.00,9hQ0.00,9hQ..00 |
| Myocardial infarction (Read code) | G30..00,G30..11,G30..12,G30..13,G30..14,G30..15,G30..16,G30..17,G300.00,G301.00,G301000,G301100,G301z00,G302.00,G303.00,G304.00,G305.00,G306.00,G307.00,G307000,G307100,G308.00,G309.00,G30A.00,G30B.00,G30X.00,G30X000,G30y.00,G30y000,G30y100,G30y200,G30yz00,G30z.00,G311500,G31y100,G35..00,G350.00,G351.00,G353.00,G35X.00 |
| Tramadol(ATC code) | N02A X02 |
| Naproxen(ATC code) | M01A E02 |
| Diclofenac(ATC code) | M01A B05 |
| Codeine(ATC code) | R05D A04 |

796,261 eligible OA patients

126,006 subjects initiated with either tramadol (n=52,902) or diclofenac (n=73,104) treatment without prescription history of both drugs before entering the study

103,635 subjects were remained

22,371 subjects were excluded:

* 16,200 had history of cancer
* 34 had history of opioid use disorder
* 6,137 had history of MI

74,938 subjects were eligible for propensity-score matching (n=30,626 in tramadol; n=44,312 in diclofenac)

28,697 subjects with missing values were excluded:

12,178 had missing values of BMI

* 1,464 had missing values of smoking status
* 4,593 had missing values of drinking status
* 10,462 had missing values of Townsend Deprivation Index score

37,324 subjects were 1:1 propensity-score matched (n=18,662 in each cohort)

**Supplemental Figure 1. Selection Process of Included Subjects for the Comparison between Tramadol and Diclofenac.** OA, osteoarthritis; MI, myocardial infarction; BMI, body mass index.

796,261 eligible OA patients

183,672 subjects initiated with either tramadol (n=107,846) or codeine (n=75,826) treatment without prescription history of both drugs before entering the study

146,049 subjects were remained

37,623 subjects were excluded:

* 27,460 had history of cancer
* 55 had history of opioid use disorder
* 10,108 had history of MI

111,996 subjects were eligible for propensity-score matching (n=65,438 in tramadol; n=46,558 in codeine)

34,053 subjects with missing values were excluded:

* 11,970 had missing values of BMI
* 1,183 had missing values of smoking status
* 6,145 had missing values of drinking status
* 14,755 had missing values of Townsend Deprivation Index score

85,444 subjects were 1:1 propensity-score matched (n=42,722 in each cohort)

**Supplemental Figure 2. Selection Process of Included Subjects for the Comparison between Tramadol and Codeine.** OA, osteoarthritis; MI, myocardial infarction; BMI, body mass index.