## Supplementary data

Table A1. Codes used for MG and THA/TKA and THA/TKA no MG cohorts

Primary THA codes		Primary TKA codes	Exclusion codes	
ICD-9-P-8151	ICD-10-P-0SRB04A	ICD-9-P-8154	ICD-9-D-82021	ICD-10-D-S72142B
ICD-10-P-0SR9019	ICD-10-P-0SRB04Z	ICD-10-P-0SRC07Z	ICD-9-D-82020	ICD-10-D-S72142C
ICD-10-P-0SR901A	ICD-10-P-0SRB07Z	ICD-10-P-0SRC0J9	ICD-9-D-8209	ICD-10-D-S72143B
ICD-10-P-0SR901Z	ICD-10-P-0SRB0J9	ICD-10-P-0SRC0JA	ICD-9-D-82031	ICD-10-D-S72143C
ICD-10-P-0SR9029	ICD-10-P-0SRB0JA	ICD-10-P-0SRC0JZ	ICD-9-D-82013	ICD-10-D-S72144B
ICD-10-P-0SR902A	ICD-10-P-0SRB0JZ	ICD-10-P0SRC0KZ	ICD-9-D-82030	ICD-10-D-S72144C
ICD-10-P-0SR902Z	ICD-10-P-0SRB0KZ	ICD-10-P-0SRC0L9	ICD-9-D-82010	ICD-10-D-S72145B
ICD-10-P-0SR9039	ICD-10-P-0SRE009	ICD-10-P-0SRC0LZ	ICD-9-D-82019	ICD-10-D-S72146B
ICD-10-P-0SR903A	ICD-10-P-0SRE00A	ICD-10-P-0SRD0J9	ICD-9-D-82012	ICD-10-D-S72146C
ICD-10-P-0SR903Z	ICD-10-P-0SRE00Z	ICD-10-P-0SRD0JA	ICD-9-D-82032	ICD-10-D-S72051A
ICD-10-P-0SR9049	ICD-10-P-0SRE019	ICD-10-P-0SRD0JZ	ICD-9-D-82011	ICD-10-D-S72052A
ICD-10-P-0SR904A	ICD-10-P-0SRE01A	ICD-10-P-0SRD0KZ	ICD-9-P-0780	ICD-10-D-S72061A
ICD-10-P-0SR904Z	ICD-10-P-0SRE01Z	ICD-10-P-0SRD0L9	ICD-10-P-07BM0ZX	ICD-10-D-S72062A
ICD-10-P-0SR907Z	ICD-10-P-0SRE039	ICD-10-P-0SRD0LZ	ICD-10-P-07BM0ZZ	ICD-10-D-S72059A
ICD-10-P-0SR90J9	ICD-10-P-0SRE03A	ICD-10-P-0SRT0J9	ICD-10-P-07BM3ZZ	ICD-10-D-S72065A
ICD-10-P-0SR90JA	ICD-10-P-0SRE03Z	ICD-10-P-0SRT0JA	ICD-10-P-07BM4ZX	ICD-10-D-S72064A
ICD-10-P-0SR90JZ	ICD-10-P-0SRE0J9	ICD-10-P-0SRT0JZ	ICD-10-P-07BM4ZZ	ICD-10-D-S72051A
ICD-10-P-0SR908Z	ICD-10-P-0SRE0JA	ICD-10-P-0SRU0J9	ICD-10-D-S72001B	ICD-10-D-S72052B
ICD-10-P-0SRA009	ICD-10-P-0SRE0JZ	ICD-10-P-0SRU0JA	ICD-10-D-S72002B	ICD-10-D-S72061B
ICD-10-P-0SRA009	ICD-10-P-0SRR019	ICD-10-P-0SRU0JZ	ICD-10-D-S72009B	ICD-10-D-S72063A
ICD-10-P-0SRA00Z	ICD-10-P-0SRR01A	ICD-10-P-0SRU0KZ	ICD-10-D-S72002C	ICD-10-D-S72064B
ICD-10-P-0SRA019	ICD-10-P-0SRR01Z	ICD-10-P-0SRV0J9	ICD-10-D-S72001C	ICD-10-D-S72066A
ICD-10-P-0SRA019	ICD-10-P-0SRR039	ICD-10-P-0SRV0JA	ICD-10-D-S72009C	ICD-10-D-S72011B
ICD-10-P-0SRA01Z	ICD-10-P-0SRR03A	ICD-10-P-0SRV0JZ	ICD-10-D-S72041B	ICD-10-D-S72012B
ICD-10-P-0SRA012	ICD-10-P-0SRR03Z	ICD-10-P-0SRW0J9	ICD-10-D-S72042B	ICD-10-D-S72012C
ICD-10-P-0SRA039	ICD-10-P-0SRR07Z	ICD-10-P-0SRW0JA	ICD-10-D-S72043B	ICD-10-D-S72019B
ICD-10-P-0SRA03Z	ICD-10-P-0SRR0J9	ICD-10-P-0SRW0JZ	ICD-10-D-S72043C	
ICD-10-P-0SRA03Z	ICD-10-P-0SRR0JA	ICD-10-P-0SRW0KZ	ICD-10-D-S72044B	
ICD-10-P-0SRA072	ICD-10-P-0SRR0JZ	CPT-27440	ICD-10-D-S72046B	
ICD-10-P-0SRA0JA	ICD-10-P-0SRR0KZ	CPT-27441	ICD-10-D-S72091B	
ICD-10-P-0SRA0JZ	ICD-10-P-0SRS019	CPT-27442	ICD-10-D-S72091C	
ICD-10-P-0SRA0KZ	ICD-10-P-0SRS01A	CPT-27443	ICD-10-D-S72092B	
ICD-10-P-0SRA0K2	ICD-10-P-0SRS01Z	CPT-27445	ICD-10-D-S72101B	
ICD-10-P-0SRB019	ICD-10-P-0SRS039	CPT-27446	ICD-10-D-S72101C	
ICD-10-P-0SRB01Z	ICD-10-P-0SRS03A	CPT-27447	ICD-10-D-S72101E	
ICD-10-P-0SRB029	ICD-10-P-0SRS03Z	0. 12, 11,	ICD-10-D-S72101F	
ICD-10-P-0SRB029	ICD-10-P-0SRS0J9		ICD-10-D-S72101J	
ICD-10-P-0SRB02Z	ICD-10-P-0SRS0JA	Myasthenia gravis codes	ICD-10-D-S721018	
ICD-10-P-0SRB022	ICD-10-P-0SRS0JZ	ICD-9-D-35800	ICD-10-D-S72102C	
ICD-10-P-0SRB039	ICD-10-P-0SRS0KZ	ICD-10-D-G7000	ICD-10-D-S72102C	
ICD-10-P-0SRB03Z	CPT-27130	.52 10 2 4, 000	ICD-10-D-S72141B	
ICD-10-P-0SRB049	01 1-27 100		ICD-10-D-S72141C	
10D-10-F-03DB049			100 100 0721410	

MG, myasthenia gravis; THA, total hip arthroplasty; TKA, total knee arthroplasty; ICD-9/ICD-10, International Classification of Diseases, Ninth Revision and Tenth Revision.

## Appendix Table A2. Codes used to evaluate for systemic complications

Acute renal failure	ICD-10-D-I607	ICD-10-D-I63339	ICD-10-D-I82403	ICD-10-D-I222	ICD-10-D-J9621
ICD-9-D-5845	ICD-10-D-1608	ICD-10-D-163341	ICD-10-D-182409	ICD-10-D-12121	ICD-10-D-39621
ICD-9-D-5846	ICD-10-D-1609	ICD-10-D-163342	ICD-10-D-182491	ICD-10-D-12121	ICD-10-D-39010
	ICD-10-D-1609				
ICD-9-D-5847		ICD-10-D-I63343	ICD-10-D-182492	ICD-10-D-I2101	ICD-10-D-J9602
ICD-9-D-5848	ICD-10-D-I611	ICD-10-D-I63349	ICD-10-D-182493	ICD-10-D-I221	ICD-10-D-J9620
ICD-9-D-5849	ICD-10-D-I612	ICD-10-D-16339	ICD-10-D-182499	ICD-10-D-I220	ICD-10-D-J9622
ICD-9-D-5800	ICD-10-D-I613	ICD-10-D-I6340	ICD-10-D-I824Y1	ICD-10-D-I228	ICD-10-D-J9691
ICD-9-D-5804	ICD-10-D-I614	ICD-10-D-I63411	ICD-10-D-I824Y2	Pneumonia	ICD-10-D-J95821
ICD-9-D-58081	ICD-10-D-I615	ICD-10-D-I63412	ICD-10-D-I824Y3	ICD-9-D-413	ICD-10-D-J9612
ICD-9-D-58089	ICD-10-D-I616	ICD-10-D-I63413	ICD-10-D-I824Y9	ICD-9-D-4800	ICD-10-D-J9692
ICD-9-D-5809	ICD-10-D-I618	ICD-10-D-163419	ICD-10-D-I824Z1	ICD-9-D-4801	ICD-10-D-J95822
ICD-10-D-N170	ICD-10-D-I619	ICD-10-D-163421	ICD-10-D-1824Z2	ICD-9-D-4802	ICD-10-D-J952
ICD-10-D-N171	ICD-10-D-1619	ICD-10-D-163422	ICD-10-D-1824Z3	ICD-9-D-4803	ICD-10-D-3952
ICD-10-D-N171					
	ICD-10-D-I6201	ICD-10-D-163423	ICD-10-D-1824Z9	ICD-9-D-4808	Sepsis
ICD-10-D-N178	ICD-10-D-I6202	ICD-10-D-I63429	ICD-10-D-I82501	ICD-9-D-4809	ICD-9-D-0031
ICD-10-D-N179	ICD-10-D-16203	ICD-10-D-I63431	ICD-10-D-182502	ICD-9-D-481	ICD-9-D-0223
ICD-10-D-N19	ICD-10-D-I629	ICD-10-D-I63432	ICD-10-D-I82503	ICD-9-D-4820	ICD-9-D-0380
ICD-10-D-N990	ICD-10-D-I6302	ICD-10-D-163433	ICD-10-D-I82509	ICD-9-D-4821	ICD-9-D-03810
ICD-10-D-N000	ICD-10-D-I6312	ICD-10-D-I63439	ICD-10-D-I82591	ICD-9-D-4822	ICD-9-D-03811
ICD-10-D-N001	ICD-10-D-I6322	ICD-10-D-I63441	ICD-10-D-182592	ICD-9-D-48230	ICD-9-D-03812
ICD-10-D-N002	ICD-10-D-I651	ICD-10-D-I63442	ICD-10-D-I82593	ICD-9-D-48231	ICD-9-D-03819
ICD-10-D-N003	ICD-10-D-I63031	ICD-10-D-I63443	ICD-10-D-182599	ICD-9-D-48232	ICD-9-D-0382
ICD-10-D-N004	ICD-10-D-163032	ICD-10-D-163449	ICD-10-D-1825Y1	ICD-9-D-48239	ICD-9-D-0383
ICD-10-D-N004	ICD-10-D-103032	ICD-10-D-163449	ICD-10-D-1825Y2	ICD-9-D-48240	ICD-9-D-03840
ICD-10-D-N006	ICD-10-D-I63039	ICD-10-D-16350	ICD-10-D-1825Y3	ICD-9-D-48241	ICD-9-D-03841
ICD-10-D-N007	ICD-10-D-I63131	ICD-10-D-I63511	ICD-10-D-I825Y9	ICD-9-D-48242	ICD-9-D-03842
ICD-10-D-N008	ICD-10-D-I63132	ICD-10-D-I63512	ICD-10-D-I825Z1	ICD-9-D-48249	ICD-9-D-03843
ICD-10-D-N009	ICD-10-D-I63133	ICD-10-D-I63513	ICD-10-D-I825Z2	ICD-9-D-48281	ICD-9-D-03844
Anemia	ICD-10-D-I63139	ICD-10-D-I63519	ICD-10-D-I825Z3	ICD-9-D-48282	ICD-9-D-03849
ICD-9-D-2851	ICD-10-D-I63231	ICD-10-D-I63521	ICD-10-D-I825Z9	ICD-9-D-48283	ICD-9-D-0388
ICD-9-D-2800	ICD-10-D-I63232	ICD-10-D-I63522	Malignant hyper-	ICD-9-D-48284	ICD-9-D-0389
ICD-10-D-D500	ICD-10-D-I63233	ICD-10-D-I63523	thermia	ICD-9-D-48289	ICD-9-D-0545
ICD-10-D-D62	ICD-10-D-163239	ICD-10-D-I63529	ICD-9-D-99586	ICD-9-D-4829	ICD-9-D-223
Cerebrovascular event	ICD-10-D-163011	ICD-10-D-163531	ICD-10-D-T883XXA	ICD-9-D-4830	ICD-9-D-380
ICD-9-D-430	ICD-10-D-163012	ICD-10-D-163532	ICD-10-D-1883XXD	ICD-9-D-4831	ICD-9-D-3812
ICD-9-D-431	ICD-10-D-163013	ICD-10-D-I63533	ICD-10-D-T883XXS	ICD-9-D-4838	ICD-9-D-382
ICD-9-D-4320	ICD-10-D-I63019	ICD-10-D-I63539	Myocardial infarction	ICD-9-D-4841	ICD-9-D-383
ICD-9-D-4321	ICD-10-D-l63111	ICD-10-D-I63541	ICD-9-D-41000	ICD-9-D-485	ICD-9-D-3840
ICD-9-D-4329	ICD-10-D-I63112	ICD-10-D-I63542	ICD-9-D-41001	ICD-9-D-486	ICD-9-D-3842
ICD-9-D-43300	ICD-10-D-I63113	ICD-10-D-I63543	ICD-9-D-41002	ICD-9-D-4870	ICD-9-D-3843
ICD-9-D-43301	ICD-10-D-I63119	ICD-10-D-I63549	ICD-9-D-41010	ICD-9-D-99731	ICD-9-D-3844
ICD-9-D-43310	ICD-10-D-I63211	ICD-10-D-I6359	ICD-9-D-41011	ICD-9-D-99732	ICD-9-D-388
ICD-9-D-43311	ICD-10-D-I63212	ICD-10-D-I636	ICD-9-D-41012	ICD-10-D-J189	ICD-9-D-389
ICD-9-D-43320	ICD-10-D-I63213	ICD-10-D-I638	ICD-9-D-41020	ICD-10-D-J188	ICD-9-D-545
ICD-9-D-43321	ICD-10-D-I63219	ICD-10-D-I639	ICD-9-D-41021	ICD-10-D-J180	ICD-10-D-A021
ICD-9-D-43330	ICD-10-D-I6300	ICD-10-D-I6601	ICD-9-D-41022	ICD-10-D-J151	ICD-10-D-A227
ICD-9-D-43331	ICD-10-D-I6309	ICD-10-D-I6602	ICD-9-D-41030	ICD-10-D-J157	ICD-10-D-A267
ICD-9-D-43380	ICD-10-D-I6310	ICD-10-D-16603	ICD-9-D-41031	ICD-10-D-J150	ICD-10-D-A327
ICD-9-D-43381	ICD-10-D-16319	ICD-10-D-16609	ICD-9-D-41031		ICD-10-D-A327
	ICD-10-D-16319			ICD-10-D-J1289	
ICD-9-D-43390		ICD-10-D-16611	ICD-9-D-41040	ICD-10-D-J09X1	ICD-10-D-A401
ICD-9-D-43391	ICD-10-D-I6329	ICD-10-D-l6612	ICD-9-D-41041	ICD-10-D-J851	ICD-10-D-A403
ICD-9-D-43400	ICD-10-D-I658	ICD-10-D-I6613	ICD-9-D-41042	ICD-10-D-J1001	ICD-10-D-A408
ICD-9-D-43401	ICD-10-D-I659	ICD-10-D-I6619	ICD-9-D-41050	ICD-10-D-J1108	ICD-10-D-A409
ICD-9-D-43410	ICD-10-D-I6501	ICD-10-D-I6621	ICD-9-D-41051	ICD-10-D-J153	ICD-10-D-A4101
ICD-9-D-43411	ICD-10-D-I6502	ICD-10-D-I6622	ICD-9-D-41052	ICD-10-D-J122	ICD-10-D-A4102
ICD-9-D-43490	ICD-10-D-I6503	ICD-10-D-I6623	ICD-9-D-41080	ICD-10-D-J1281	ICD-10-D-A411
ICD-9-D-43491	ICD-10-D-I6509	ICD-10-D-I6629	ICD-9-D-41081	Pulmonary embolism	ICD-10-D-A412
ICD-10-D-I6000	ICD-10-D-I6521	ICD-10-D-I668	ICD-9-D-41082	ICD-9-D-41511	ICD-10-D-A413
ICD-10-D-16001	ICD-10-D-16522	ICD-10-D-1669	ICD-9-D-41090	ICD-9-D-41513	ICD-10-D-A414
ICD-10-D-16002	ICD-10-D-16523	ICD-9-D-4359	ICD-9-D-41091	ICD-9-D-41519	ICD-10-D-A4150
ICD-10-D-10002	ICD-10-D-10525	ICD-9-D-4358	ICD-9-D-41091	ICD-9-D-41519	ICD-10-D-A4151
ICD-10-D-16010			ICD-9-D-41092 ICD-9-D-41070	ICD-9-D-4162 ICD-10-D-12609	ICD-10-D-A4151
	ICD-10-D-G458	Deep vein thrombosis			
ICD-10-D-16012	ICD-10-D-G459	ICD-9-D-45340	ICD-9-D-41071	ICD-10-D-I2699	ICD-10-D-A4153
ICD-10-D-1602	ICD-10-D-I6330	ICD-9-D-45341	ICD-9-D-41072	ICD-10-D-I2782	ICD-10-D-A4159
ICD-10-D-16020	ICD-10-D-I63311	ICD-9-D-45342	ICD-9-D-41060	Respiratory failure	ICD-10-D-A4181
ICD-10-D-I6021	ICD-10-D-I63312	ICD-9-D-45111	ICD-9-D-41061	ICD-9-D-51853	ICD-10-D-A4189
ICD-10-D-I6022	ICD-10-D-I63313	ICD-9-D-45119	ICD-9-D-41062	ICD-9-D-51851	ICD-10-D-A419
ICD-10-D-I6030	ICD-10-D-I63319	ICD-9-D-45389	ICD-10-D-I214	ICD-9-D-51883	ICD-10-D-A427
ICD-10-D-I6031	ICD-10-D-I63321	ICD-9-D-4539	ICD-10-D-I213	ICD-9-D-51884	ICD-10-D-A5486
ICD-10-D-I6032	ICD-10-D-I63322	ICD-9-D-4512	ICD-10-D-I2119	ICD-9-D-51881	ICD-10-D-B377
ICD-10-D-1604	ICD-10-D-I63323	ICD-9-D-45350	ICD-10-D-I2109	ICD-9-D-51852	ICD-10-D-R6520
ICD-10-D-16050	ICD-10-D-163329	ICD-9-D-45351	ICD-10-D-I2129	ICD-9-D-51882	ICD-10-D-R6521
ICD-10-D-16051	ICD-10-D-163331	ICD-9-D-45352	ICD-10-D-12129	ICD-9-D-51862	100 10 0 110021
ICD-10-D-16051	ICD-10-D-103331	ICD-9-D-45552	ICD-10-D-1240	ICD-10-D-39601	
ICD-10-D-1606	ICD-10-D-I63333	ICD-10-D-182402	ICD-10-D-I2102	ICD-10-D-J9690	

ICD-9/ICD-10, International Classification of Disease, Ninth Revision and Tenth Revision.

## Appendix Table A3. Codes used to evaluate for joint complications

Joint infection	Periprosthetic fracture	Aseptic loosening	Prosthetic dislocation	
	•			ICD-10-P-0SSB44Z
ICD-9-D-99667	ICD-9-D-99644	ICD-9-D-99641	ICD-9-P-7975	
ICD-9-D-99666	ICD-9-D-99644	ICD-9-D-99641	ICD-9-P-7985	ICD-10-P-0SSBX4Z
ICD-10-D-T8451XA	ICD-10-D-M9701XA	ICD-10-D-T84030A	ICD-9-P-7976	ICD-10-P-0SSBX5Z
ICD-10-D-T8451XD	ICD-10-D-M9702XA	ICD-10-D-T84030D	ICD-9-P-7986	ICD-10-P-0SSBXZZ
ICD-10-D-T8451XS	ICD-10-D-M9711XA	ICD-10-D-T84030S	ICD-10-P-0SS904Z	ICD-10-P-0SSC04Z
ICD-10-D-T8452XA	ICD-10-D-M9711XD	ICD-10-D-T84031A	ICD-10-P-0SS905Z	ICD-10-P-0SSC0ZZ
ICD-10-D-T8452XD	ICD-10-D-M9711XS I	ICD-10-D-T84031D	ICD-10-P-0SS90ZZ	ICD-10-P-0SSC3ZZ
ICD-10-D-T8452XS	CD-10-D-M9712XA	ICD-10-D-T84031S	ICD-10-P-0SS934Z	ICD-10-P-0SSC4ZZ
ICD-10-D-T8453XA	ICD-10-D-M9712XD	ICD-10-D-T84032A	ICD-10-P-0SS93ZZ	ICD-10-P-0SSCXZZ
ICD-10-D-T8453XD	ICD-10-D-M9712XS	ICD-10-D-T84032D	ICD-10-P-0SS944Z	ICD-10-P-0SSD04Z
ICD-10-D-T8453XS	ICD-10-D-T84042A	ICD-10-D-T84032S	ICD-10-P-0SS9X4Z	ICD-10-P-0SSD0ZZ
ICD-10-D-T8454XA	ICD-10-D-T84042D	ICD-10-D-T84033A	ICD-10-P-0SS9XZZ	ICD-10-P-0SSDX5Z
ICD-10-D-T8454XD	ICD-10-D-T84042S	ICD-10-D-T84033D	ICD-10-P-0SSB04Z	ICD-10-P-0SSDXZZ
ICD-10-D-T8454XS	ICD-10-D-T84043A	ICD-10-D-T84033S	ICD-10-P-0SSB0ZZ	
	ICD-10-D-T84043D		ICD-10-P-0SSB34Z	
	ICD-10-D-T84043S		ICD-10-P-0SSB3ZZ	

ICD-9/10, International Classification of Diseases, Ninth Revision and Tenth Revision.